

NAVAL SUPPORT ACTIVITY MID-SOUTH

TURKEY SHOOT AREA SOIL REMOVAL AND
SAMPLING WORK PLAN

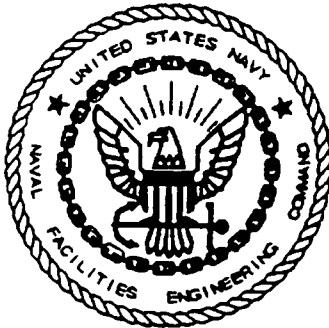
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North Charleston, South Carolina

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The Contractor, EnSafe Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0318 is complete, accurate, and complies with all requirements of the contract.

Date: August 31, 1999
Signature: *Lawson Anderson*
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Title: Task Order Manager

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1.0 INTRODUCTION

As part of the U.S. Navy Installation Restoration Program, the following Voluntary Corrective Action Work Plan has been prepared for soil removal and sampling to remedy lead contamination identified in soil at the "Turkey Shoot" area of Naval Support Activity (NAVSUPPACT or NSA) Mid-South (formerly Naval Air Station Memphis until October 1996, then NSA Memphis until October 1, 1998). This area, used for approximately 10 years for annual recreational firearm-related activities by the City of Millington, is in an undeveloped and unsecured area in the southwestern corner of the NSA Mid-South Northside (Figure 1). A turkey shoot involves target-shooting at a silhouette, presumably of a turkey, from a distance of 25 to 50 yards with shotguns. This area was investigated for potential lead contamination associated with such activities.

The objectives of this work plan are to:

- Report the extent of lead contamination and the soil clean-up level
- Discuss disposal characterization of the lead contaminated soil
- Outline soil removal procedures and disposal options for soil and water
- Outline confirmation sample procedures
- Outline health and safety protocols for the removal action.

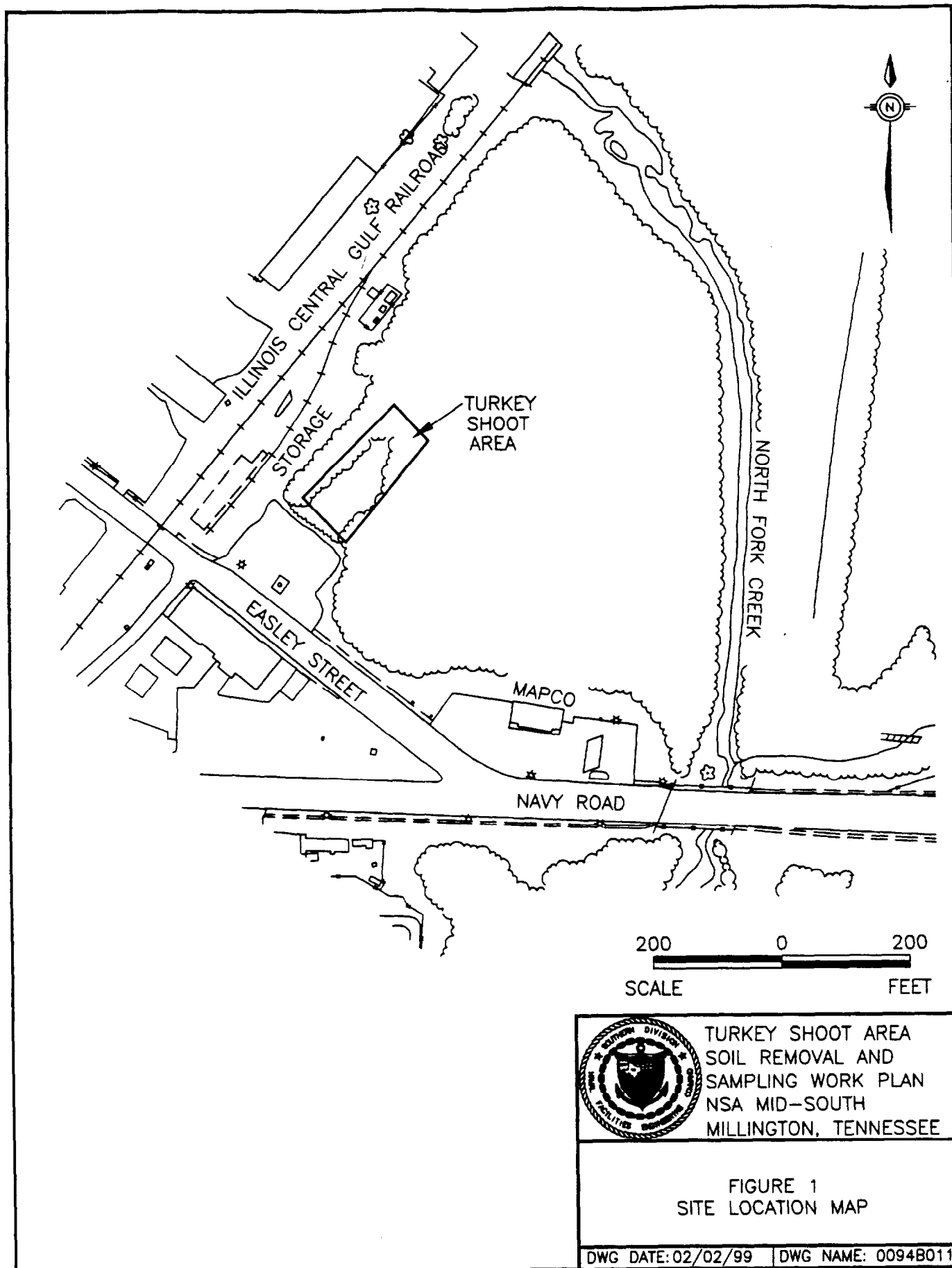
1.1 Previous Investigations

During the 1995 Base Realignment and Closure (BRAC) Gray Area Investigation (EnSafe/Allen & Hoshall [E/A&H], June 16, 1995), soil samples were collected from what was presumed to be the former turkey shoot target area. At the time, the sampling rationale was to collect a limited number of biased samples to determine whether lead concentrations in site surface soil exceeded the 400 milligrams per kilogram (mg/kg) cleanup level for lead in soil established by the U.S. Environmental Protection Agency (USEPA), Office of Solid Waste and Emergency Response (USEPA, 1994). Two soil samples were collected from 0 to 12 inches below land surface (bls)

and submitted to an offsite laboratory for analysis; one for total lead analysis (USEPA Method 6010) and one for Toxicity Characteristic Leaching Procedure (TCLP) lead (USEPA Method 1311/6010). TCLP-lead was selected to determine if lead concentrations in soil were potentially leaching to underlying soil and groundwater. The total lead sample result was 1,260 mg/kg, which exceeded 400 mg/kg; however, the TCLP-lead sample result was 3.6 milligrams per liter (mg/L) which was less than the USEPA established TCLP-lead threshold of 5 mg/L. Further site investigation was recommended based on the elevated total lead concentration.

In October 1995, the Follow-Up Gray Area Investigation (EnSafe, July 23, 1998) was conducted to delineate the extent of lead contamination in surface soil. The sampling was conducted using a random grid-based approach, with the grid centered on the previous sample location. A 100-foot by 100-foot grid, with 10-foot by 10-foot squares, was established across the Turkey Shoot area (Figure 2) and the squares numbered from 1 to 100 starting in the southwest corner and moving from left to right. Then twenty squares were selected using a random number table. Next a five-point composite sample of equal aliquots of soil was collected from the 0- to 1-foot bls interval in each selected grid square and submitted to an offsite laboratory for total lead and Synthetic Precipitation Leaching Procedure ([SPLP] to simulate leaching due to rainfall) lead analyses. Analytical data from the follow-up investigation (Table 1) indicated 11 of the 20 total lead samples exceeded 400 mg/kg. Fourteen of the samples had an SPLP lead concentration less than 0.3 mg/L (the detection limit), while the maximum SPLP lead detection was 1.9 mg/L.

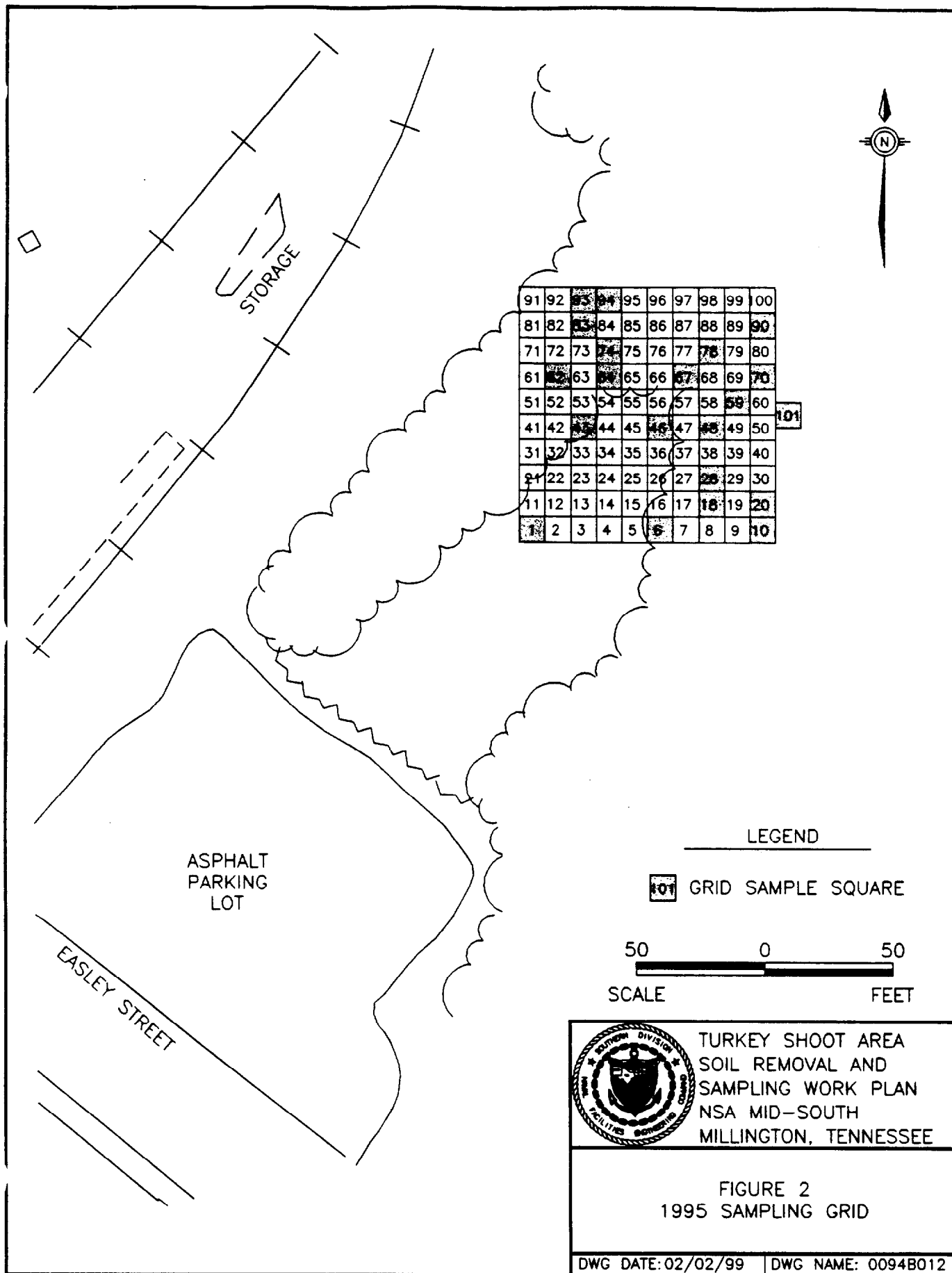
The 1995 analytical data set was evaluated using GeoEas geostatistical software, which is used for two-dimensional analyses of spatially distributed data. For this type of analysis a minimum of 20 data points is recommended to ensure a confidence limit of 90% or higher. The geostatistical results indicated one additional sample was needed in the grid-square 101 area (see Figure 2) to define the extent of contamination. The sample from grid square 101 indicated 330 mg/kg of lead.



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Table 1
Turkey Shoot — 1995 Soil Sample Grid Data Summary

Sample ID	Total Lead (mg/kg)	SPLP Lead (mg/L)
TSGS000101 (Grid 1)	386	0.3 U
TSGS000601 (Grid 6)	508	0.3 U
TSGS001001 (Grid 10)	412	0.3 U
TSGS001801 (Grid 18)	318	0.3 U
TSGS002001 (Grid 20)	278	0.3 U
TSGS002801 (Grid 28)	378	0.31
TSGS004301 (Grid 43)	927	0.56
TSGS004601 (Grid 46)	1,240	1.3
TSGS004801 (Grid 48)	663	0.3 U
TSGS005901 (Grid 59)	61,700	1.9
TSGS006201 (Grid 62)	163	0.3 U
TSGS006401 (Grid 64)	719	0.3 U
TSGS006701 (Grid 67)	1,300	0.31
TSGS007001 (Grid 70)	502	0.3 U
TSGS007401 (Grid 74)	387	0.3 U
TSGS007801 (Grid 78)	746	0.3 U
TSGS008301 (Grid 83)	155	0.3 U
TSGS009001 (Grid 90)	808	0.33
TSGS009301 (Grid 93)	157	0.3 U
TSGS009401 (Grid 94)	229	0.3 U
TSGS010101 (Grid 101)	330	—

Notes:

Bold concentrations exceed the 400 mg/kg lead soil cleanup level (USEPA, 1994).

mg/kg = Milligrams per kilogram

mg/L = Milligrams per liter

U = Compound not detected. Value represents the detection limit.

— = Not analyzed

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2.0 PRE-REMOVAL SAMPLING

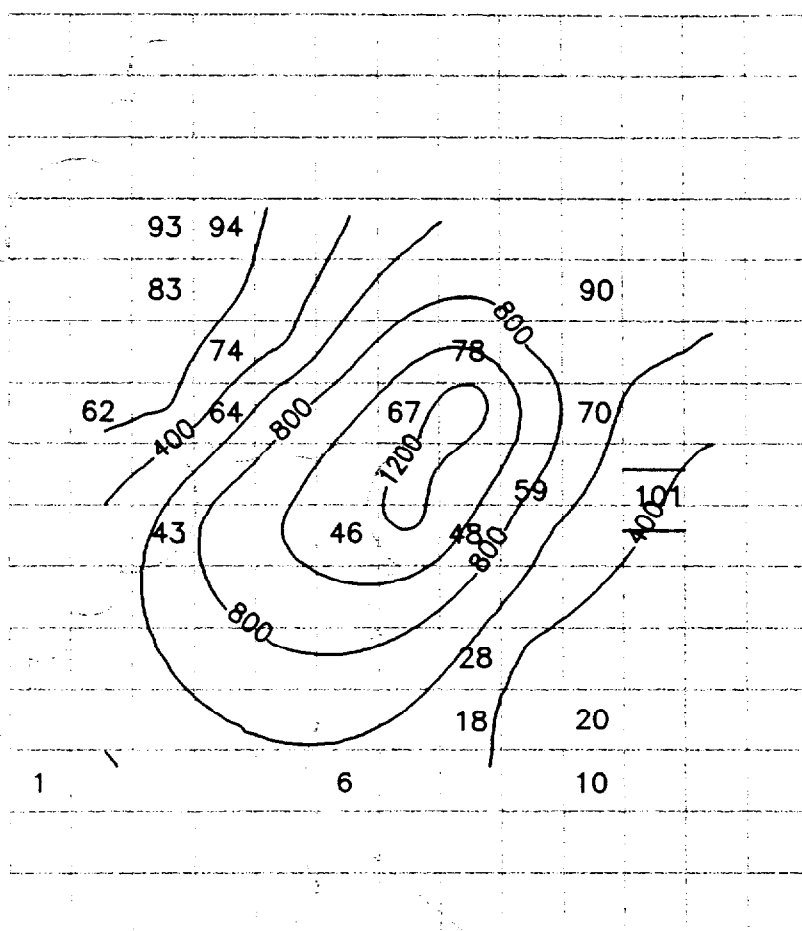
In 1998, the technical memorandum *Ecological Risk, Turkey Shoot Area* (EnSafe, May 4, 1998) was submitted to USEPA, Region IV. Following review of the memorandum, the USEPA recommended that lead-contaminated soil in the Turkey Shoot area be excavated to a soil cleanup level of 400 mg/kg total lead. Analysis of the 1995 data with the GeoEas software indicated only one additional sample was required to adequately delineate lead contamination in the Turkey Shoot area; however, the 400 mg/kg contour was not completely delineated (Figure 3). Therefore, additional soil sampling was performed in 1999 to delineate the northeastern and southwestern extent of lead contamination. Also, the proposed excavation area was sampled prior to any excavation to characterize soil for disposal purposes and to facilitate loading and transportation of trucks during removal.

2.1 Delineation of Extent

In February 1999, additional soil sampling was conducted to delineate the extent of lead-contaminated soil in the northeast and southwest portions of the Turkey Shoot area. Since the 1995 grid system of 101 squares did not cover enough area to delineate the extent of contamination, a new grid system with more 10-foot by 10-foot squares and a new numbering system using a combination of letters and numbers was used to select additional grid squares, as shown in Figure 4. Ten grid squares were selected and sampled by homogenizing a five-point composite of equal aliquots of soil from the 0- to 3-inch bls interval; one of the grid squares was a duplicate from the 1995 grid system. The 1995 sample TSGS005901 (which corresponds to 1995 grid square 59 [Figure 2]) was identified as having a total lead concentration of 61,700 mg/kg, a significantly higher concentration than the other detections. Therefore, this grid square was resampled (1999 grid square I8 [Figure 4]) for total lead and TCLP lead to confirm this "outlier" value, and to determine if this soil would require disposal as a characteristic hazardous waste. The other nine grid square samples were analyzed for total lead only, to delineate the extent of lead contamination above the cleanup goal of 400 mg/kg.

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—800— LEAD CONCENTRATION CONTOUR (mg/kg)

1 1995 SAMPLE GRID SQUARE

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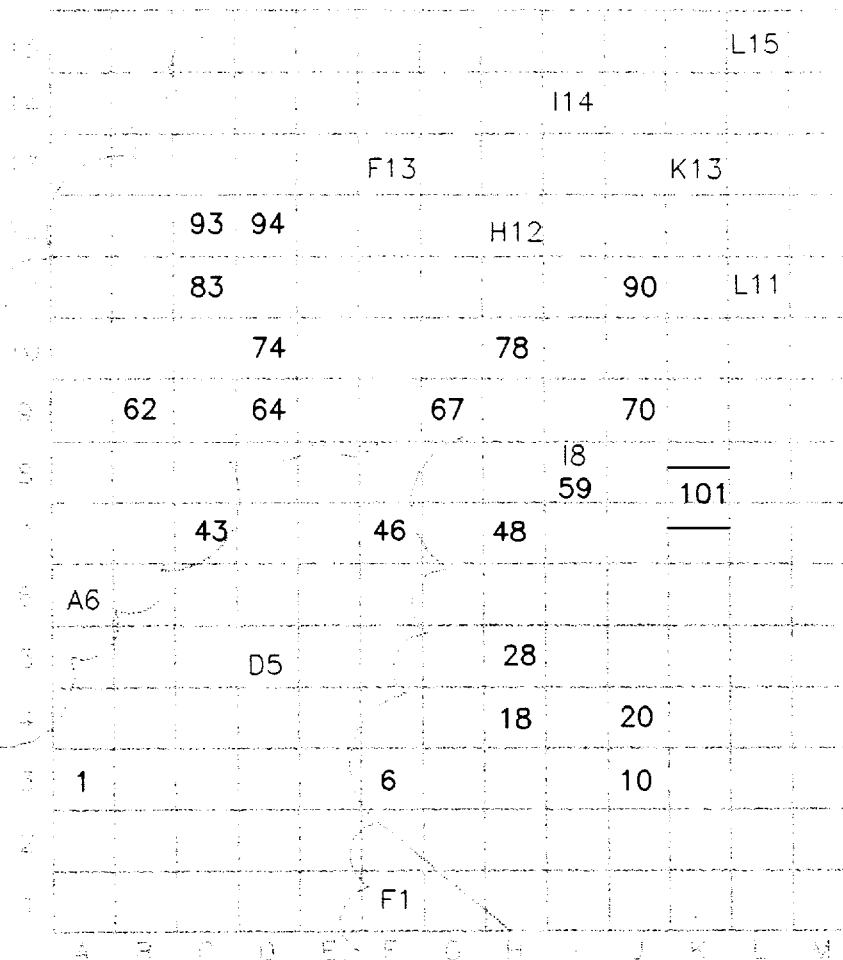
FIGURE 3
LEAD CONCENTRATION CONTOURS
FROM 1995 SAMPLES

DWG DATE: 08/30/99 DWG NAME: 0094S026

000014

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LEGEND

- SAMPLE GRID
- 1 1995 SAMPLE GRID SQUARE
- F1 FEBRUARY 1999 SAMPLE GRID SQUARE

30 0 30
SCALE FEET



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FIGURE 4
FEBRUARY 1999 SAMPLE
GRID LOCATIONS

DWG DATE: 08/26/99 DWG NAME: 0094S027

Analytical results for the resampled grid square (1995 grid 59 and 1999 grid I8) indicated a lead concentration of 3,300 mg/kg and a TCLP-lead concentration of 13 mg/L. The lead concentration was an order of magnitude less than the 1995 analytical results and the TCLP-lead concentration exceeded the USEPA established TCLP-lead limit of 5 mg/L. Of the other nine grid square samples only one (F1 at 340 mg/kg of lead) indicated a lead concentration less than 400 mg/kg. Table 2 lists the February 1999 grid squares sampled and their corresponding lead concentrations. Appendix A includes analytical reports for the February 1999 grid square samples. Based on the February 1999 sample event, additional sampling was recommended to delineate the extent of contamination.

Table 2
Turkey Shoot — February 1999 Soil Sample Grid Data Summary

Grid Square ID	Total Lead (mg/kg)	TCLP-Lead (mg/L)
A6	970	—
D5	2,000	—
F1	340	—
F13	970	—
H12	3,700	—
I8	3,300	13
I14	1,900	—
K13	1,300	—
L11	1,700	—
L15	1,500	—

Notes:

Bold concentrations exceed the 400 mg/kg lead soil cleanup level recommended by USEPA.

mg/kg = Milligrams per kilogram

mg/L = Milligrams per liter

— = Not analyzed

In March and April 1999, two additional sampling events were conducted to delineate the extent of lead contamination exceeding 400 mg/kg. Ten grid squares were sampled in March 1999, six of which exceeded 400 mg/kg lead. Eleven grid squares were sampled in April 1999, two of which exceeded 400 mg/kg lead. Table 3 lists the lead concentrations identified in the March and April 1999 grid square samples. Appendix A includes analytical reports for the March and April 1999 grid square samples.

Table 3
 Turkey Shoot — March and April 1999 Soil Sample Grid Data Summary

Grid Square ID	Total Lead (mg/kg)
MARCH 1999	
BB6	231
A8	228
B2	537
D14	269
F17	286
I17	559
M9	760
O11	1,830
O14	1,340
O18	1,190
APRIL 1999	
A1	296
I20	369
N22	722
O7	200
Q25	560

Table 3
Turkey Shoot — March and April 1999 Soil Sample Grid Data Summary

Grid Square ID	Total Lead (mg/kg)
R9	63.0
S14	124
S18	292
S22	386
V16	56.7
V21	78.0

Notes:

Bold concentrations exceed the 400 mg/kg lead soil cleanup level recommended by USEPA.

mg/kg = Milligrams per kilogram

Figure 5 shows the March 1999 sample locations and Figure 6 shows the April 1999 sample locations.

2.2 Disposal Characterization

Disposal characterization sampling was performed in conjunction with the extent of contamination sampling events. Characterization samples were collected prior to excavation of soil for two reasons: (1) to eliminate storage of excavated contaminated soil in an unsecured area and (2) to expedite completion of the remedial action. Discussions with Mr. Leland Hares of the Tennessee Department of Environment and Conservation (TDEC), Division of Solid Waste, confirmed that characterization prior to excavation was acceptable so long as samples are representative of the waste material being disposed.

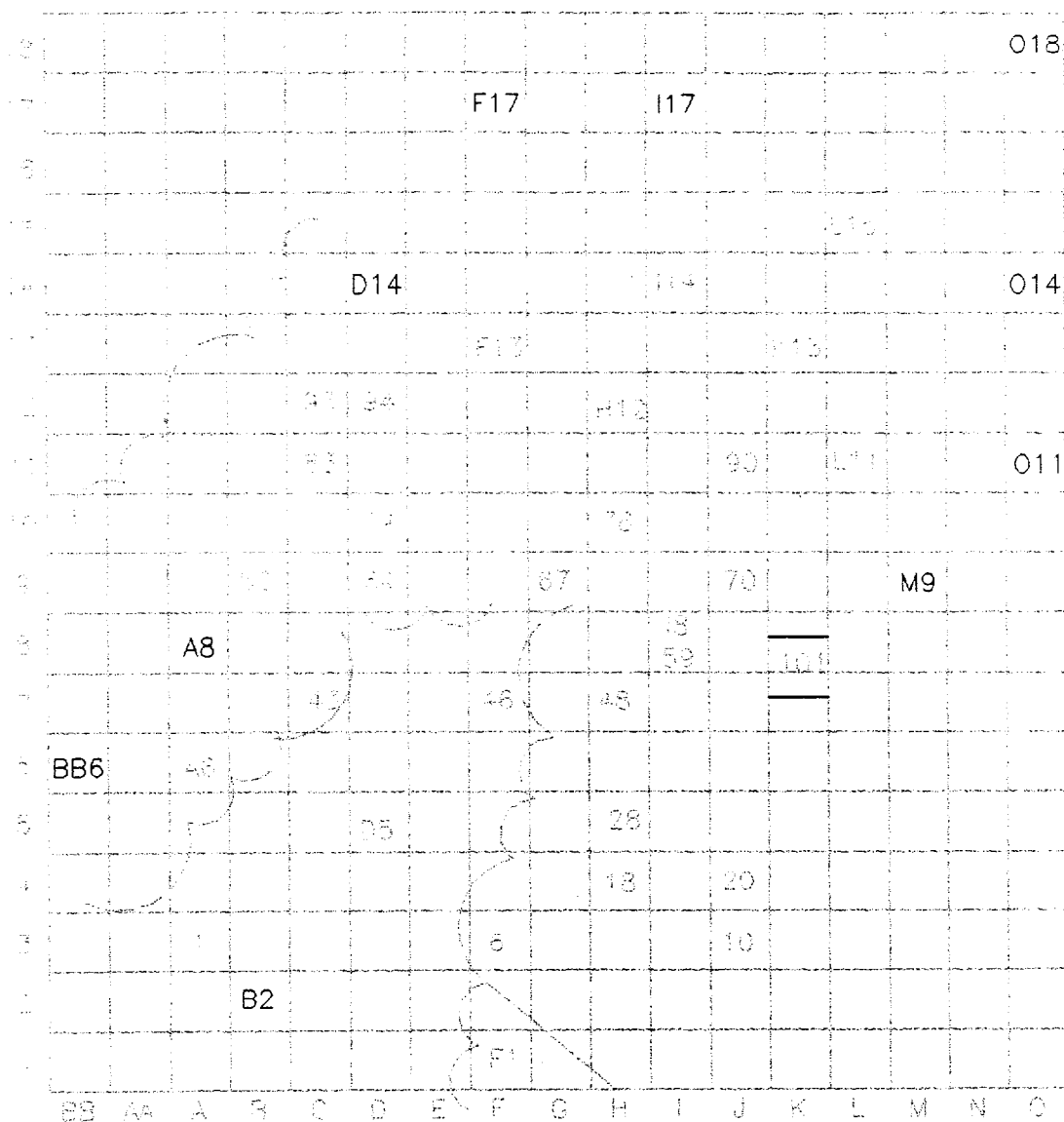
Based on the lead-contaminated areas identified during the 1995 sample event, disposal characterization samples were collected in February 1999 from each of three areas as shown in Figure 7. The sample collected in Area 2 was considered representative of worst-case conditions,

as it included 1995 grid squares 46, 59, and 67 which had the three highest total lead detections during the 1995 event. The soil characterization samples were 5-point composite samples collected from 0 to 3 inches bls after removing the top layer of vegetation, roots, and organic matter. Each of the characterization samples was analyzed for TCLP Resource Conservation and Recovery Act (RCRA) metals and total lead. The soil characterization sample results were:

- Area 1 — lead at 2,100 mg/kg; TCLP-lead at 6 mg/L
- Area 2 — lead at 2,000 mg/kg; TCLP-lead at 15 mg/L, TCLP-arsenic at 0.31 mg/L, and TCLP-barium at 1.3 mg/L
- Area 3 — lead at 2,300 mg/kg; TCLP-lead at 6.1 mg/L and TCLP barium at 1.1 mg/L

All other TCLP RCRA metals were at concentrations below method detection limits. Analytical results from all three sample areas indicated TCLP-lead concentrations exceeded the USEPA TCLP-lead limit of 5 mg/L. The other metals identified during TCLP analysis, arsenic and barium, were at concentrations below their USEPA TCLP limits — arsenic at 5 mg/L and barium at 100 mg/L. Appendix A includes analytical reports for the February 1999 characterization samples.

Because all three characterization sample areas indicated lead concentrations which would require excavated soil to be disposed of as hazardous waste, additional characterization sampling was conducted. During March 1999 the three areas shown in Figure 7 were again sampled for disposal characterization, except this time samples were collected from multiple intervals in each area. The



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- ☐ SAMPLE GRID
- ☐ PREVIOUS SAMPLE GRID SQUARE
- ☐ B2 MARCH 1999 SAMPLE GRID SQUARE

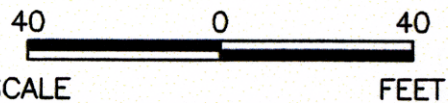
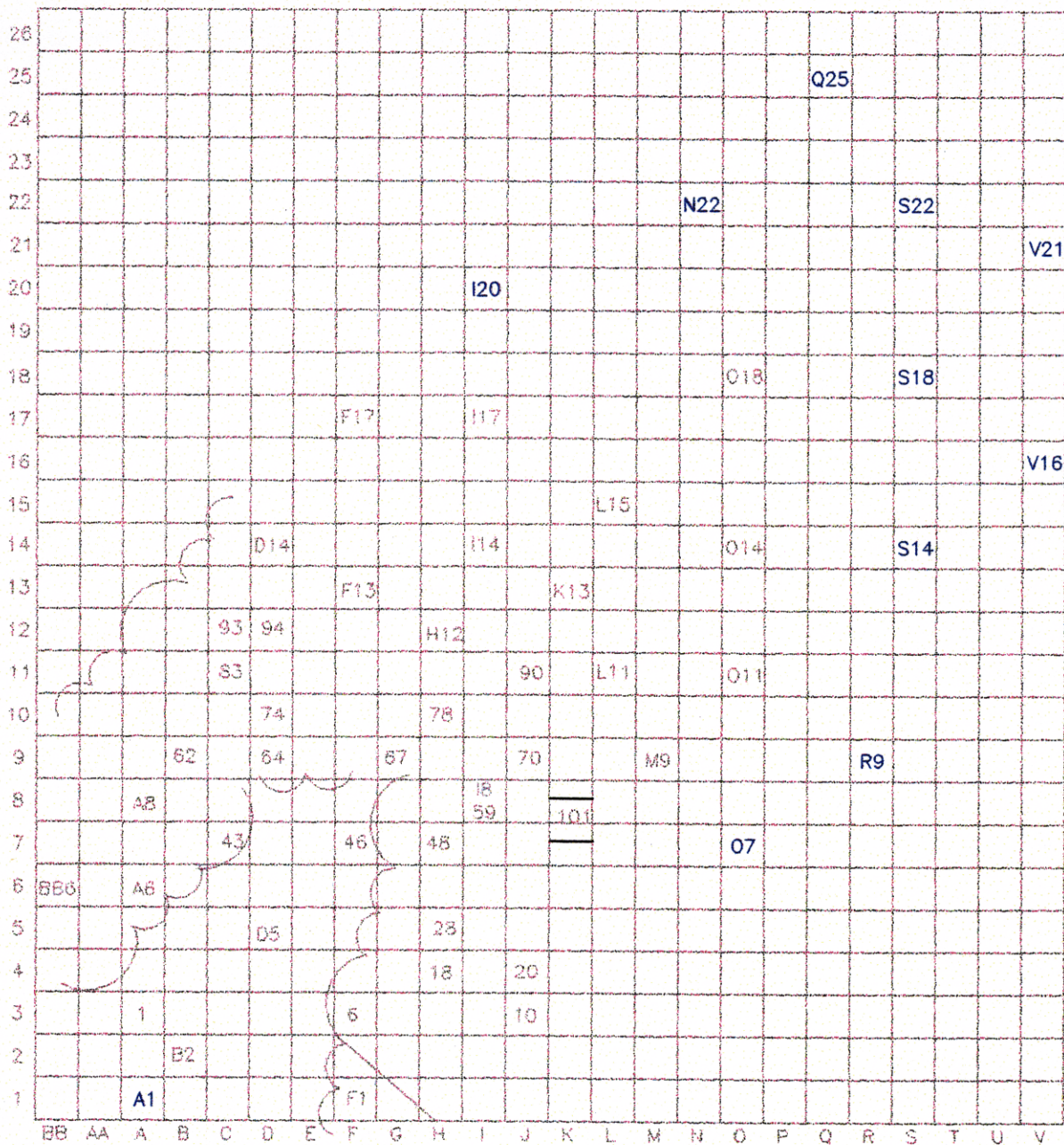


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FIGURE 5
MARCH 1999 SAMPLE
GRID LOCATIONS

DWG DATE: 08/26/99 DWG NAME: 0094S028

000021



- LEGEND**
- SAMPLE GRID
 - PREVIOUS SAMPLE GRID SQUARE
 - A1 APRIL 1999 SAMPLE GRID SQUARE



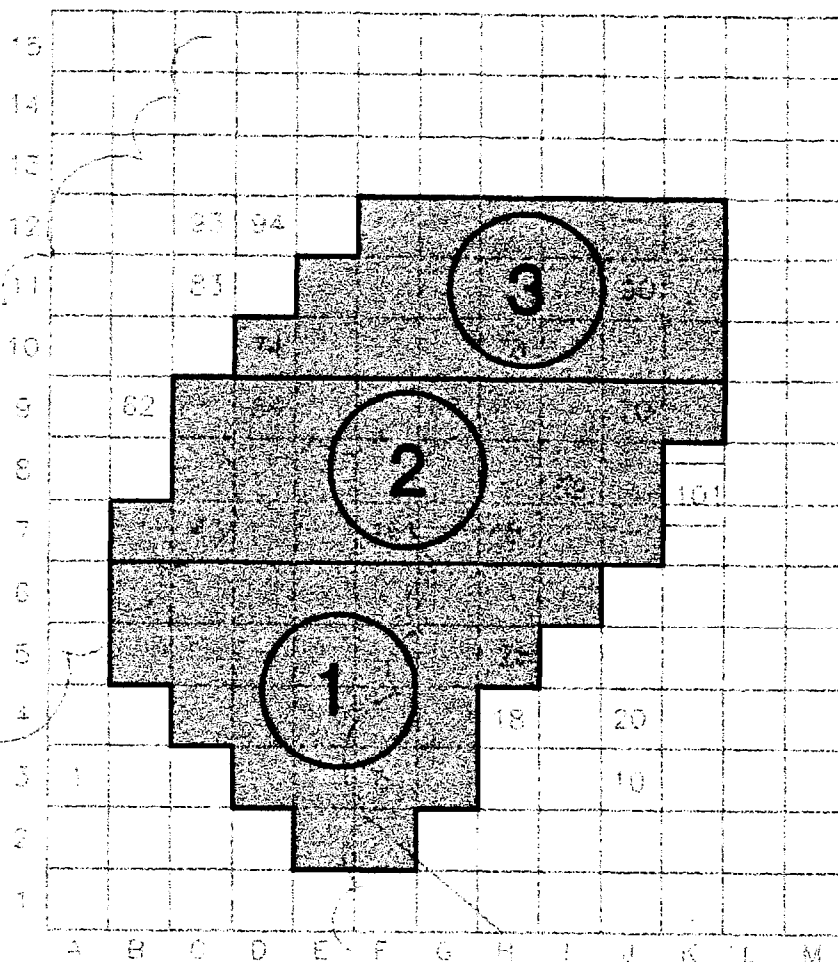
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MILLINGTON, TENNESSEE

FIGURE 6
APRIL 1999 SAMPLE
GRID LOCATIONS

DWG DATE: 08/26/99 | DWG NAME: 0094S029

00656A01Y

00002



LEGEND



LEAD CONTAMINATED SOIL
BASED ON 1995 SAMPLES



BOUNDARY OF COMPOSITE SAMPLE



1995 SAMPLE LOCATION

30 0 30
SCALE FEET



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FIGURE 7
SOIL DISPOSAL CHARACTERIZATION
SAMPLE LOCATIONS

DWG DATE: 08/26/99 DWG NAME: 0094S030

000023

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0 to 3-inch bls, 3- to 6-inch bls, and 6- to 9-inch bls intervals were sampled in each of the three areas by collecting a 5-point composite and homogenizing the sample prior to packaging. All samples were analyzed for total lead while the 3- to 6-inch bls and 6- to 9-inch bls samples were analyzed for TCLP-lead. Table 4 lists the analytical results from the March 1999 characterization samples. Appendix A includes analytical reports for the March 1999 characterization samples.

The 0 to 3-inch bls soil sample from Area 2 again indicated a TCLP-lead concentration exceeding the USEPA TCLP-lead limit; however, the 3- to 6-inch bls and 6- to 9-inch bls samples from all three areas were well below the TCLP-lead limit. Based on the February and March 1999 characterization samples, Turkey Shoot soil excavated from the 0 to 3-inch bls interval should be handled and disposed of as a waste exhibiting the characteristic of toxicity for lead, while soil deeper than 3 inches bls does not exhibit TCLP-lead concentrations exceeding its USEPA limit. All soil excavated from the Turkey Shoot area will be treated as a waste exhibiting the characteristic of toxicity for lead, since efforts to segregate the 0 to 3-inch bls soil from other excavated soil would be extremely difficult.

Table 4
Turkey Shoot — March 1999 Characterization Sample Results

Sample ID	Total Lead (mg/kg)	TCLP Lead (mg/L)
Area 1		
0 - 3 inches	1,440	—
3 - 6 inches	647	0.23
6 - 9 inches	69	0.2U
Area 2		
0 - 3 inches	90,100	6.1
3 - 6 inches	754	0.2U
6 - 9 inches	155	0.2U

Table 4
Turkey Shoot — March 1999 Characterization Sample Results

Sample ID	Total Lead (mg/kg)	TCLP Lead (mg/L)
Area 3		
0 - 3 inches	2,360	—
3 - 6 inches	819	0.2U
6 - 9 inches	140	0.2U

Notes:

mg/kg = Milligrams per kilogram
mg/L = Milligrams per liter
U = Compound not detected. Value represents the detection limit.
— = Not analyzed

3.0 SOIL REMOVAL

3.1 Clearing and Grubbing

The proposed Turkey Shoot excavation area is currently vegetated with grass, small saplings, and medium sized trees (8 to 10-inch trunk diameter). This vegetation will be cleared and stumps removed prior to excavation activities. All small vegetation will be chipped and stockpiled onsite. Stumps will be excavated and disposed of at the same landfill as the excavated soil. Upon completion of backfilling and seeding, the wood chips will be used to supplement the supply of mulch over the disturbed area.

3.2 Contaminated Soil Removal

When a date has been set for removal activities to begin, the TDEC, Division of Superfund, Memphis Field Office, will receive at least a 48-hour advance notice.

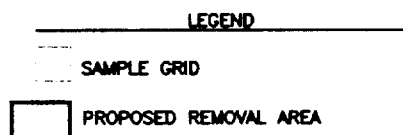
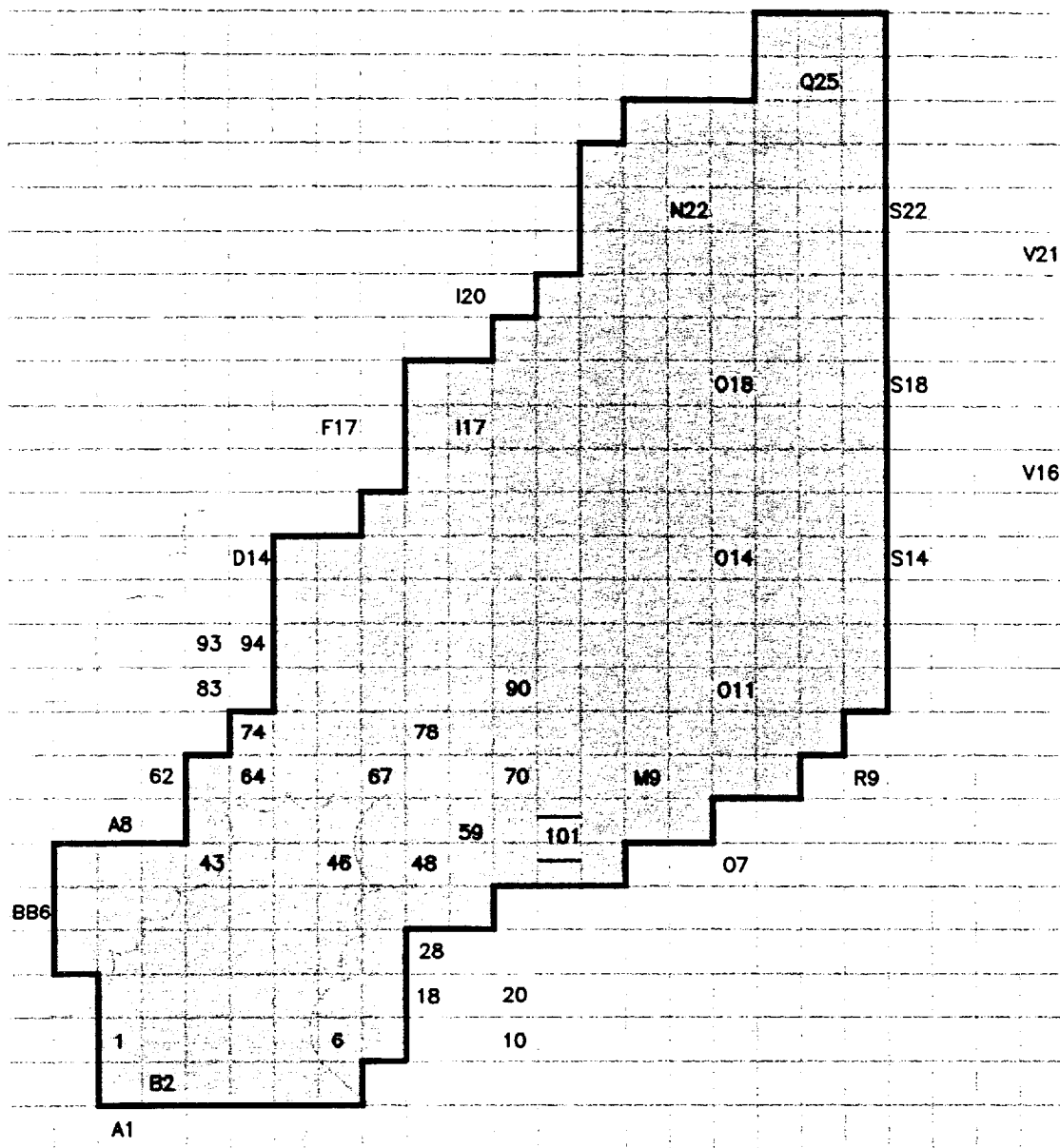
Following clearing and grubbing, contaminated soil will be excavated and placed directly into lined and covered dump trailers or trucks provided by the removal or disposal contractor. The estimated area of soil to be removed, shown in Figure 8, consists of 242 grid squares measuring 10-foot by 10-foot. Initially, a six-inch lift will be excavated from the 242 grid squares, generating approximately 540 cubic yards (CY) of material, assuming the material will increase in volume 20% during excavation (unexcavated soil volume is approximately 450 CY). The approximate soil mass for disposal is estimated at 675 tons assuming an in-place weight of 1.5 tons per CY. Additional soil may be removed based on confirmation sample results.

3.3 Backfilling of Excavation

When confirmation sample results (see Section 4) indicate lead concentrations are less than 400 mg/kg, the excavated area will be backfilled with clean soil, which may be any commercially available, clean structural fill. At a minimum, the top 6 inches of soil will be a fertile, friable,

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FIGURE 8
PROPOSED REMOVAL AREA

DWG DATE: 08/26/99 DWG NAME: 0094S031

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natural surface soil capable of sustaining vigorous plant growth from a freely draining area and shall be free from roots, stumps, or other deleterious matter.

3.4 Fertilizing, Seeding, and Mulching

The removal contractor will fertilize all disturbed areas with a commercially available fertilizer that meets the following requirements:

- A 10-10-10 ratio of nitrogen, phosphorus, and potassium for an application rate of 500 pounds per acre.
- A minimum of 30 percent of the nitrogen in the fertilizer shall be water insoluble.

Seed shall be applied to the area at a rate of 100 pounds per acre. Grass seed shall be of the mixture presented in Table 5, or other approved by the NSA Mid-South, Public Works Office.

**Table 5
Required Seeding Mixture***

Season	Seed	Pounds per Acre
August 1 through December 1	Kentucky 31 Fescue	70
	English Rye	20
	White Clover	10
	Total	100

Note:

- * = From Tennessee Department of Transportation Bureau of Highways "Standard Specifications for Road and Bridge Construction."

Mulch shall be applied in an adequate amount to provide cover for all seeded areas. Mulch shall be hay, straw, or an erosion control mat. The chipped material from clearing operations will be used to supplement mulch from offsite.

3.5 Disposal of Contaminated Soil and Decontamination Water

Soil

In February and March 1999, disposal characterization samples were collected from the area to be excavated. Based on analytical results from the 0 to 3-inch bls characterization samples, the soil to be excavated will be handled and disposed of as a solid waste that exhibits the characteristic of toxicity for lead. Therefore, the excavated soil should be assigned the USEPA hazardous waste number D008. Additional analyses for the excavated soil may be necessary, according to the requirements of the selected disposal facility.

Investigation-derived waste (IDW) will be handled in accordance with Section 4.13 of the *Comprehensive RFI Work Plan* (E/A&H, 1994) and the *NAS Memphis IDW Management Plan* (E/A&H, October 25, 1995).

Water

Decontamination water from removal activities, equipment decontamination water, and any water from site cleaning activities will be containerized by the removal contractor in portable storage tanks or 55-gallon drums. EnSafe will be responsible for sampling containerized liquids and ensuring containers are labeled and transported to a location specified by the NSA Mid-South, Public Works Department, Environmental Division. The removal contractor will transport liquid containers to the specified location.

Liquid samples will be analyzed for total lead, oil and grease, and any other locally required analyses. Analytical results will be submitted within 24 hours of receipt by EnSafe to the NSA Mid-South, Public Works Department, Environmental Division who will forward them to the City of Millington engineering contractor. Upon approval by the City of Millington and/or the city's engineering contractor, the removal contractor will transport and discharge the containerized liquids into the NSA Mid-South sanitary-sewer system at a location specified by

NSA Mid-South, Public Works Department, Environmental Division personnel. The NSA Mid-South sanitary sewer is connected to the City of Millington Publicly Owned Treatment Works.

If liquid samples indicate contaminants exceeding locally acceptable concentrations, the removal contractor will transfer any liquids in storage tanks to closed-top, DOT-approved drums, and transport them to Building 1694, the Part B Permitted Hazardous Waste Storage Facility, at NSA Mid-South. Then drummed liquids will be disposed of by NSA Mid-South in accordance with federal, state, and local regulations.

3.6 Decontamination Procedures

Decontamination will be performed in accordance with Section 4.11 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

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4.0 CONFIRMATION SAMPLING

4.1 Confirmation Sampling

After excavation is complete, eighteen confirmation soil samples will be collected by EnSafe personnel from each area shown in Figure 9. Confirmation samples will be a homogenous mix of a 5-part composite of equal soil volumes collected from 0 to 3-inches into the base of the excavation. Confirmation samples will be collected in accordance with procedures described in Section 4.4.3 of the *Comprehensive RFI Work Plan* (E/A&H, 1994). Confirmation samples will be analyzed for total lead by USEPA Method 6010. The quickest possible laboratory turnaround time (estimated at 48 hours) will be requested for all confirmation sample analytical results.

4.2 Soil-Cleanup Levels

In 1998, the technical memorandum *Ecological Risk, Turkey Shoot Area* (EnSafe, May 4, 1998) was submitted to USEPA, Region IV. Following review of the memorandum, the USEPA recommended that lead-contaminated soil in the Turkey Shoot area be excavated to a soil cleanup level of 400 mg/kg total lead. The NSA Mid-South BRAC Cleanup Team has agreed to the recommended cleanup level.

4.3 Analytical Requirements

Analytical requirements for samples collected during confirmation sampling and liquid characterization are summarized in Table 6. Level III-equivalent Data Quality Objectives will be used for all sample analyses.

4.4 Sample Management

Samples will be managed in accordance with Sections 4.12 and 5 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

Table 6
Sample Summary and Analytical Requirements

Sample	No.	Analytical Parameters	Rationale	Turnaround
Confirmation	18	Total Lead (Method 6010)	Confirmation samples will be collected to determine if soil has been removed to below cleanup levels.	48 hours
Liquid Characterization	1	Total Lead (Method 6010) Oil & Grease (Method 9070)	Containerized liquids will be sampled for disposal characterization.	48 hours

4.5 Sample Custody

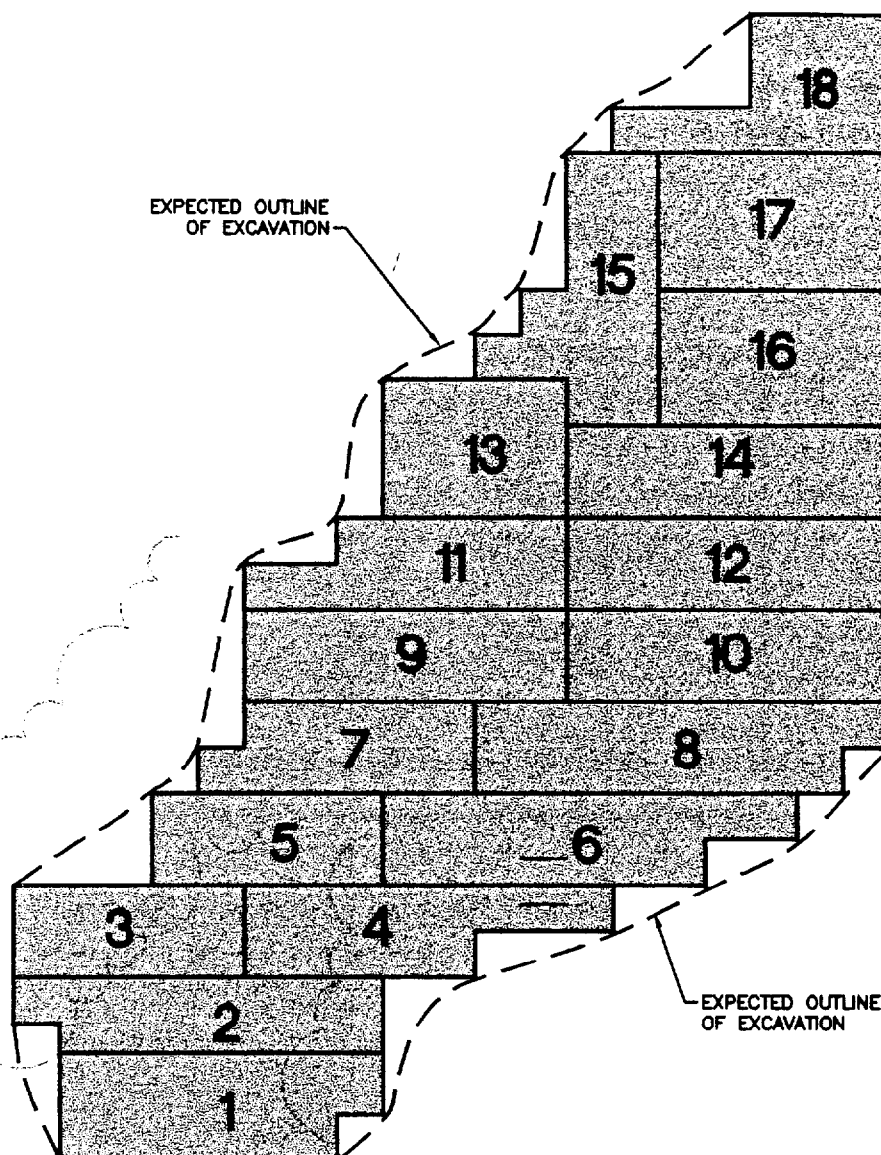
Sample custody will be maintained in accordance with Section 4.12.5 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

4.6 Quality Assurance/Quality Control

Quality assurance/quality control procedures will be in accordance with Section 4.14 of the *Comprehensive RFI Work Plan* (E/A&H, 1994).

4.7 Data Management Plan

The Data Management Plan presented in Section 5 of the *Comprehensive RFI Work Plan* (E/A&H, 1994) will be followed for sampling activities.



EXPECTED OUTLINE
OF EXCAVATION

EXPECTED OUTLINE
OF EXCAVATION

40 0 40
SCALE FEET

LEGEND



PROPOSED REMOVAL AREA



BOUNDARY OF COMPOSITE SAMPLE AREAS



TURKEY SHOOT AREA
SOIL REMOVAL AND
SAMPLING WORK PLAN
NSA MID-SOUTH
MILLINGTON, TENNESSEE

FIGURE 9
CONFIRMATION SAMPLE GRID

DWG DATE: 08/26/99 DWG NAME: 0094S032

000037

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5.0 HEALTH AND SAFETY PLAN

During confirmation sampling, EnSafe personnel will comply with the Comprehensive Health and Safety Plan (CHASP) (Section 7 of the *Comprehensive RFI Work Plan* [E/A&H, 1994]), included as Appendix B of this document, and the Site-Specific Health and Safety Plan (SSHASP) included as Appendix C of this document. *It should be noted that the emergency contacts and phone numbers in Section 7.8 of the October 1994 CHASP have changed and are updated in Table 2 of the SSHASP.* The EnSafe CHASP and SSHASP establish minimum health and safety requirements for fieldwork. The removal contractor must submit a HASP meeting these minimum requirements, or a letter adopting EnSafe's CHASP and SSHASP as its official HASP.

Naval Support Activity Mid-South
Turkey Shoot Area Soil Removal and Sampling Work Plan
Revision: 3
August 31, 1999

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6.0 REFERENCES

- EnSafe/Allen & Hoshall. (1994). *Comprehensive RCRA Facility Investigation Work Plan*, Naval Air Station Memphis. E/A&H: Memphis, Tennessee.
- EnSafe/Allen & Hoshall. (October 25, 1995). *NAS Memphis IDW Management Plan*. E/A&H: Memphis, Tennessee.
- EnSafe/Allen & Hoshall. (June 16, 1995). *Final Gray Area Investigation Report, NAS Memphis, Millington, Tennessee*. E/A&H: Memphis, Tennessee.
- EnSafe. (May 4, 1998). *Ecological Risk, Turkey Shoot Area, NSA Memphis*. EnSafe: Memphis, Tennessee.
- EnSafe. (July 23, 1998). *Northside Follow-Up Gray Area Investigation Report, Revision:3, NSA Memphis*. EnSafe: Memphis, Tennessee.
- USEPA. (1994). *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*. Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12.

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Appendix A
Summary Analytical Reports

900041

February 1999 Grid Square Samples

990042

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
FEBRUARY 1999 GRID SQUARE SAMPLES

LEAD		SAMPLE ID -----> ORIGINAL ID -----> LAB SAMPLE ID ----> ID FROM REPORT --> SAMPLE DATE -----> DATE EXTRACTED --> DATE ANALYZED -----> MATRIX -----> UNITS ----->	TUR-S-00A6-00 TURS00A600 S910841*9 TURS00A600 02/04/99 02/10/99 02/12/99 Soil MG/KG	TUR-S-00D5-00 TURS00D500 S910841*2 TURS00D500 02/04/99 02/10/99 02/16/99 Soil MG/KG	TUR-S-00F1-00 TURS00F100 S910841*1 TURS00F100 02/04/99 02/10/99 02/12/99 Soil MG/KG	TUR-S-00I8-00 TURS00I800 S910841*10 TURS00I800 02/04/99 02/10/99 02/16/99 Soil MG/KG	TUR-S-0F13-00 TURS0F1300 S910841*3 TURS0F1300 02/04/99 02/10/99 02/12/99 Soil MG/KG	TUR-S-0H12-00 TURS0H1200 S910841*4 TURS0H1200 02/04/99 02/10/99 02/16/99 Soil MG/KG	
CAS #	Parameter	MEM67	VAL	MEM67	VAL	MEM67	VAL	MEM67	VAL
7439-92-1	Lead	970.		2000.		340.		3300.	

10043

DATALCP3
08/19/99

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
FEBRUARY 1999 GRID SQUARE SAMPLES

Page: 2
Time: 10:36

LEAD 900041	SAMPLE ID ----->	TUR-S-0114-00	TUR-S-0K13-00	TUR-S-0L11-00	TUR-S-0L15-00		
	ORIGINAL ID ----->	TURSO11400	TURSOK1300	TURSOL1100	TURSOL1500		
	LAB SAMPLE ID ---->	S910841*5	S910841*7	S910841*8	S910841*6		
	ID FROM REPORT -->	TURSO11400	TURSOK1300	TURSOL1100	TURSOL1500		
	SAMPLE DATE ----->	02/04/99	02/04/99	02/04/99	02/04/99		
	DATE EXTRACTED -->	02/10/99	02/10/99	02/10/99	02/10/99		
	DATE ANALYZED -->	02/16/99	02/16/99	02/16/99	02/16/99		
	MATRIX ----->	Soil	Soil	Soil	Soil		
	UNITS ----->	MG/KG	MG/KG	MG/KG	MG/KG		
CAS #	Parameter	MEM67 VAL	MEM67 VAL	MEM67 VAL	MEM67 VAL		
7439-92-1	Lead	1900.	1300.	1700.	1500.		

*** Validation Complete ***

DATALCP3
08/19/99

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
FEBRUARY 1999 GRID SQUARE SAMPLES

Page: 3
Time: 10:36

TCLP-METAL		SAMPLE ID -----> ORIGINAL ID -----> LAB SAMPLE ID ----> ID FROM REPORT --> SAMPLE DATE -----> DATE EXTRACTED --> DATE ANALYZED ----> MATRIX -----> UNITS ----->	TUR-S-0018-00 TURS001800 S910841*10 TURS001800 02/04/99 02/11/99 02/16/99 Soil MG/L					
CAS #	Parameter	MEM67	VAL					
7439-92-1	Lead	13.						
7439-97-6	Mercury	NR						
7440-38-2	Arsenic	NR						
7440-39-3	Barium	NR						
7440-43-9	Cadmium	NR						
7440-47-3	Chromium	NR						
7782-49-2	Selenium	NR						
7440-22-4	Silver	NR						

*** Validation Complete ***

000045

March 1999 Grid Square Samples

000045

DATALCP3
08/19/99

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
MARCH 1999 GRID SQUARE SAMPLES

Page: 1
Time: 10:43

LEAD		SAMPLE ID ----->	TUR-S-00A8-03	TUR-S-00B2-03	TUR-S-00M9-03	TUR-S-00B6-03	TUR-S-00D14-03	TUR-S-00F17-03
		ORIGINAL ID ----->	TURS00A803	TURS00B203	TURS00M903	TURS00B603	TURS00D1403	TURS00F1703
		LAB SAMPLE ID ---->	S911646*3	S911646*1	S911646*10	S911646*2	S911646*4	S911646*5
		ID FROM REPORT --->	TURS00A803	TURS00B203	TURS00M903	TURS00B603	TURS00D1403	TURS00F1703
		SAMPLE DATE ----->	03/11/99	03/11/99	03/11/99	03/11/99	03/11/99	03/11/99
		DATE EXTRACTED -->	03/18/99	03/18/99	03/18/99	03/18/99	03/18/99	03/18/99
		DATE ANALYZED ---->	03/23/99	03/22/99	03/23/99	03/22/99	03/23/99	03/23/99
		MATRIX ----->	Soil	Soil	Soil	Soil	Soil	Soil
		UNITS ----->	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
CAS #	Parameter		MEM71 VAL	MEM71 VAL	MEM71 VAL	MEM71 VAL	MEM71 VAL	MEM71 VAL
7439-92-1	Lead		228. J	537. J	760. J	231. J	269. J	286. J

000047

*** Validation Complete ***

DATA LCP3
08/19/99

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
MARCH 1999 GRID SQUARE SAMPLES

Page: 2
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CAS #		Parameter	MEM71	VAL	MEM71	VAL	MEM71	VAL	MEM71	VAL
7439-92-1	Lead		559.	J	1830.	J	1340.	J	1990.	J

*** Validated Complete ***

April 1999 Grid Square Samples

000049

DATALCP3
08/19/99

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
APRIL 1999 GRID SQUARE SAMPLES

Page: 1
Time: 10:49

LEAD		SAMPLE ID -----> ORIGINAL ID -----> LAB SAMPLE ID ----> ID FROM REPORT --> SAMPLE DATE -----> DATE EXTRACTED --> DATE ANALYZED ----> MATRIX -----> UNITS ----->	TUR-S-00A1-06 TURS00A106 S912156*1 TURS00A106 04/05/99 04/08/99 04/10/99 Soil MG/KG	TUR-S-0007-06 TURS000706 S912156*12 TURS000706 04/05/99 04/08/99 04/10/99 Soil MG/KG	TUR-S-00R9-06 TURS00R906 S912156*11 TURS00R906 04/05/99 04/08/99 04/10/99 Soil MG/KG	TUR-S-0120-06 TURS012006 S912156*3 TURS012006 04/05/99 04/08/99 04/10/99 Soil MG/KG	TUR-S-0N22-06 TURS0N2206 S912156*4 TURS0N2206 04/05/99 04/08/99 04/10/99 Soil MG/KG	TUR-S-0Q25-06 TURS0Q2506 S912156*2 TURS0Q2506 04/05/99 04/08/99 04/10/99 Soil MG/KG					
CAS #	Parameter		MEM72	VAL	MEM72	VAL	MEM72	VAL	MEM72	VAL	MEM72	VAL	
7439-92-1	Lead		296.		200.		63.		369.		722.		560.

000050

000050

*** Validation Complete ***

DATALCP3
08/19/99

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
APRIL 1999 GRID SQUARE SAMPLES

Page: 2
Time: 10:49

LEAD 00000	SAMPLE ID ----->	TUR-S-0S14-06	TUR-S-0S18-06	TUR-S-0S22-06	TUR-S-0V16-06	TUR-S-0V21-06	
	ORIGINAL ID ----->	TURS0S1406	TURS0S1806	TURS0S2206	TURS0V1606	TURS0V2106	
	LAB SAMPLE ID ---->	S912156*9	S912156*5	S912156*7	S912156*8	S912156*10	
	ID FROM REPORT -->	TURS0S1406	TURS0S1806	TURS0S2206	TURS0V1606	TURS0V2106	
	SAMPLE DATE ----->	04/05/99	04/05/99	04/05/99	04/05/99	04/05/99	
	DATE EXTRACTED -->	04/08/99	04/08/99	04/08/99	04/08/99	04/08/99	
	DATE ANALYZED ---->	04/10/99	04/10/99	04/10/99	04/10/99	04/10/99	
	MATRIX ----->	Soil	Soil	Soil	Soil	Soil	
	UNITS ----->	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	
CAS #	Parameter	MEM72 VAL	MEM72 VAL	MEM72 VAL	MEM72 VAL	MEM72 VAL	
7439-92-1	Lead	124.	292.	386.	56.7	78.	

February 1999 Disposal Characterization Samples

000052

DATALCP3
08/19/99

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
FEBRUARY 1999 DISPOSAL CHARACTERIZATION

Page: 1
Time: 10:39

LEAD		SAMPLE ID -----> ORIGINAL ID -----> LAB SAMPLE ID ----> ID FROM REPORT --> SAMPLE DATE -----> DATE EXTRACTED --> DATE ANALYZED ----> MATRIX -----> UNITS ----->	TUR-S-0001-00 TURS000100 S910841*11 TURS000100 02/04/99 02/10/99 02/16/99 Soil MG/KG	TUR-S-0002-00 TURS000200 S910841*12 TURS000200 02/04/99 02/10/99 02/16/99 Soil MG/KG	TUR-S-0003-00 TURS000300 S910841*13 TURS000300 02/04/99 02/10/99 02/16/99 Soil MG/KG				
CAS #	Parameter	MEM67	VAL	MEM67	VAL	MEM67	VAL		
7439-92-1	Lead	2100.		2000.		2300.			
				</					

*** Validation Complete ***

DATALCP3
08/19/99

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
FEBRUARY 1999 DISPOSAL CHARACTERIZATION

Page: 2
Time: 10:39

TCLP-METAL		SAMPLE ID -----> TUR-S-0001-00		TUR-S-0002-00		TUR-S-0003-00				
		ORIGINAL ID -----> TURS000100		TURS000200		TURS000300				
		LAB SAMPLE ID ----> S910841*11		S910841*12		S910841*13				
		ID FROM REPORT ----> TURS000100		TURS000200		TURS000300				
		SAMPLE DATE -----> 02/04/99		02/04/99		02/04/99				
		DATE EXTRACTED ----> 02/11/99		02/11/99		02/11/99				
		DATE ANALYZED ----> 02/11/99		02/11/99		02/11/99				
		MATRIX -----> Soil		Soil		Soil				
		UNITS -----> MG/L		MG/L		MG/L				
CAS #	Parameter	MEM67	VAL	MEM67	VAL	MEM67	VAL			
7439-92-1	Lead	6.		15.		6.1				
7439-97-6	Mercury	0.02	U	0.02	U	0.02	U			
7440-38-2	Arsenic	0.2	U	0.31		0.2	U			
7440-39-3	Barium	1.	U	1.3		1.1				
7440-43-9	Cadmium	0.1	U	0.1	U	0.1	U			
7440-47-3	Chromium	0.2	U	0.2	U	0.2	U			
7782-49-2	Selenium	0.5	U	0.5	U	0.5	U			
7440-22-4	Silver	0.1	U	0.1	U	0.1	U			

March 1999 Disposal Characterization Samples

900055

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
MARCH 1999 DISPOSAL CHARACTERIZATION

CAS #	Parameter	TUR-S-0001-03 MEM71 VAL	TUR-S-0001-06 MEM71 VAL	TUR-S-0001-09 MEN71 VAL	TUR-S-0002-03 MEM71 VAL	TUR-S-0002-06 MEM71 VAL	TUR-S-0002-09 MEM71 VAL
7439-92-1	Lead	1440. J	647. J	69. J	90100. J	754. J	155. J

*** Validation Complete ***

DATALCP3
08/19/99

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
MARCH 1999 DISPOSAL CHARACTERIZATION

Page: 2
Time: 10:46

LEAD		SAMPLE ID ----->	TUR-S-0003-03	TUR-S-0003-06	TUR-S-0003-09			
		ORIGINAL ID ----->	TURS000303	TURS000306	TURS000309			
		LAB SAMPLE ID ---->	S911646*12	S911646*19	S911646*20			
		ID FROM REPORT -->	TURS000303	TURS000306	TURS000309			
		SAMPLE DATE ----->	03/12/99	03/12/99	03/12/99			
		DATE EXTRACTED -->	03/18/99	03/18/99	03/18/99			
		DATE ANALYZED ----->	03/23/99	03/23/99	03/23/99			
		MATRIX ----->	Soil	Soil	Soil			
		UNITS ----->	MG/KG	MG/KG	MG/KG			
CAS #	Parameter	MEM71	VAL	MEM71	VAL	MEM71	VAL	
7439-92-1	Lead	2360.	J	819.	J	140.	J	

*** Validation Complete ***

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
MARCH 1999 DISPOSAL CHARACTERIZATION

TCLP-LEAD		SAMPLE ID -----> ORIGINAL ID -----> LAB SAMPLE ID ----> ID FROM REPORT --> SAMPLE DATE -----> DATE EXTRACTED ---> DATE ANALYZED ----> MATRIX -----> UNITS ----->	TUR-S-0001-06 TURS000106 S911646*15 TURS000106 03/12/99 03/17/99 03/31/99 Soil MG/L	TUR-S-0001-09 TURS000109 S911646*16 TURS000109 03/12/99 03/17/99 03/31/99 Soil MG/L	TUR-S-0002-03 TURS000203 S911646*31 TURS000203 03/12/99 03/18/99 03/19/99 Soil MG/L	TUR-S-0002-06 TURS000206 S911646*17 TURS000206 03/12/99 03/17/99 03/31/99 Soil MG/L	TUR-S-0002-09 TURS000209 S911646*18 TURS000209 03/12/99 03/17/99 03/31/99 Soil MG/L	TUR-S-0003-06 TURS000306 S911646*19 TURS000306 03/12/99 03/17/99 03/31/99 Soil MG/L
CAS #	Parameter	MEM71 VAL	MEM71 VAL	MEM71 VAL	MEM71 VAL	MEM71 VAL	MEM71 VAL	MEM71 VAL
7439-92-1	Lead	0.23	0.2 U	6.1	0.2 U	0.2 U	0.2 U	0.2 U

*** Validation Complete ***

000055

DATALCP3
08/19/99

NSA MID-SOUTH
NSA MID-SOUTH TURKEY SHOOT AREA
MARCH 1999 DISPOSAL CHARACTERIZATION

Page: 4
Time: 10:46

TCLP-LEAD		SAMPLE ID -----> TUR-S-0003-09					
		ORIGINAL ID -----> TURS000309					
		LAB SAMPLE ID ----> S911646*20					
		ID FROM REPORT --> TURS000309					
		SAMPLE DATE -----> 03/12/99					
		DATE EXTRACTED --> 03/17/99					
		DATE ANALYZED ----> 03/31/99					
		MATRIX -----> Soil					
		UNITS -----> MG/L					
CAS #	Parameter	MEM71	VAL				
7439-92-1	Lead	0.2	U				

*** Validation Complete ***

Appendix B
Comprehensive Health and Safety Plan

000060

7.0 COMPREHENSIVE HEALTH AND SAFETY PLAN (CHASP)

A Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) is being conducted at the Naval Air Station (NAS) Memphis, Tennessee. The purpose of this program is to assess the nature and extent of contamination at the site and to determine if follow-up action is required to maintain compliance with environmental regulations.

This Comprehensive Health and Safety Plan (CHASP) is applicable to field operations to be conducted during the RFI at NAS Memphis. The Navy project contract number with EnSafe/Allen & Hoshall (E/A&H) is N62467-89-D-0318. A Site-Specific Health and Safety Plan (SSHSP) will be developed and implemented to address site-specific activities and hazards.

The provisions of this plan are mandatory for E/A&H personnel and those personnel under contract to E/A&H or the Navy e.g., the United States Geological Survey (USGS) whose work responsibilities call for them to enter a work zone (See 7.3 Work Areas). Such personnel must read this plan and sign the plan acceptance form (See Attachment C) before starting site activities. In addition, such personnel will operate in accordance with the most current requirements of 29 CFR 1910.120, *Standards for Hazardous Waste Workers and Emergency Responders* (HAZWOPER). These regulations include the following provisions for employees exposed to hazardous substances, health hazards, or safety hazards: training as described in 120(e), medical surveillance as described in 120(f), and personal protective equipment (PPE) described in 120(g).

All non-E/A&H personnel present in E/A&H work areas shall either adopt and abide by this CHASP and the corresponding SSHSP or shall have their own safety plan which, at a minimum, meets the requirements of the E/A&H CHASP and SSHSP.

At least one person certified in CPR and First Aid will be present during field activities. In addition, the E/A&H employees that are onsite will be certified in CPR and First Aid.

7.1 Site Characterization

Upon review of available information, the following chemicals are representative of the types of chemical hazards (contamination) known or suspected to be present on NAS Memphis: benzene, toluene, ethylbenzene, xylene, polychlorinated biphenyls (PCBs), naphtha, waste oils, and cleaning solutions. SSHSPs shall be designed to protect workers from chemical hazards known or suspected to be present at a specific location. The following information will be included in the SSHSP:

- A site map displaying the location of planned work areas within the site
- The expected site-specific contaminants of concern and the (suspected) magnitude and scope of the situation
- Decontamination procedures
- A material safety data sheet (MSDS) for each contaminant known or expected of being present

7.1.1 Work Areas

Site control for all work areas will be established and maintained according to the recommendations in the EPA's *Interim Standard Operating Safety Guides*, Revised September, 1982. Three general zones of operation, each described below, will be established to reduce the potential for contaminant migration and risk of personnel exposure:

- The exclusion zone (EZ) or "hot zone"

- contamination reduction zone (CRZ), and the
- support zone (SZ)

Field personnel shall enter the SZ and don their PPE, then they will move through the CRZ and into the EZ. After completing their work or when taking a break they will leave the EZ through the CRZ, decontaminate themselves and their equipment, and leave the area through the SZ.

The exclusion zone is the area being investigated, sampled, or otherwise of interest. It is where chemical contamination is known or suspected to exist. The EZ includes the work area except for areas set aside as either the CRZ or SZ. The EZ will be defined and demarcated in the field; in the case of drilling, the EZ is typically about 50 feet in diameter with the borehole located in the middle.

Only authorized personnel that meet the training requirements of OSHA 29 CFR 1910.120 (40 hour HAZWOPER course with an annual 8-hour refresher course or equivalent training) are permitted within the exclusion and contamination reduction zones. Prior to entering the EZ, and at all times when in the EZ, all personnel shall be outfitted in and properly use all required PPE. A checkpoint may be established at the edge of the EZ to regulate the flow of personnel and equipment in and out of the area.

When using Level A, B, or C PPE, all personnel entering the EZ must use the "buddy system". All persons entering the EZ must be able to:

- Provide his or her partner with assistance
- Observe his or her partner for signs of chemical or heat exposure
- Periodically check the integrity of his or her partner's protective clothing
- Notify the shift supervisor, his representative, or others if emergency help is needed

Additionally, at least one person shall remain outside the EZ and have available at least the same level of PPE as those who entered the EZ. The person outside the EZ will provide logistical and safety support as needed.

The contamination reduction zone serves as a buffer between the EZ and the SZ and is intended to prevent the spread of contaminants from the work areas. All decontamination procedures will be conducted in this area. The CRZ shall be adjacent to and upwind of the EZ and include all decontamination stations. When leaving the SZ and entering the CRZ, personnel must be wearing the prescribed PPE. Exiting the CRZ requires the removal of all contaminants through compliance with established decontamination procedures as contained herein and in the corresponding SSHSP.

The support zone is the outermost area and is considered a non-contaminated or clean area. The support area will be equipped with an appropriate first-aid station and equipment to perform gross decontamination of health and safety equipment (e.g., air monitoring equipment). The SZ is adjacent to and upwind of the CRZ.

The actual location and boundary of work zones will be determined and demarcated in the field. Existing site conditions such as prevailing wind direction, location of utilities, roads, security, etc., shall be considered when determining zone locations.

Changes in meteorologic conditions or site conditions may necessitate relocating the CRZ or SZ. These conditions (e.g., wind direction, surface water run-off patterns, etc.) will be monitored at all times. A wind sock or similar device will be placed in a location visible to all site workers.

7.1.2 Work Area Access

A file will be maintained onsite that includes a current OSHA initial HAZWOPER training certificate (or copy) and an up-to-date refresher certificate for all employees involved in field activities. Employees that are unsure that a copy of their certificate is onsite shall bring a copy of their certificate with them and present it to the Site Health and Safety Officer before beginning field work. Personnel that fail to meet or abide by the criteria established in the CHASP or SSHSP shall be restricted from entering work areas.

Subcontractors, DOD oversight personnel, and other site visitors must provide the Site Health and Safety Officer with documentation showing that their HAZWOPER training is current and must agree to comply with this CHASP and the corresponding SSHSP or equivalent health and safety requirements prior to site entry. Personnel that fail to meet or abide by the criteria established in the CHASP or SSHSP shall be restricted from entering work areas.

The Site Health and Safety Officer may suspend site work and may instruct personnel to evacuate the area. Examples of situations when this may happen are:

- Site conditions have changed, for whatever reason, such that the SSHSP does not adequately address the current situation,
- Safety precautions being used are inadequate for the situation, or
- Personnel including E/A&H, subcontractors, visitors, or DOD are or may be exposed to an immediate health hazard.

7.1.3 Site History and Description

A review of the existing site data will be conducted to assess the potential hazards to be encountered by E/A&H and contractor personnel and addressed in the SSHSP. The location of NAS Memphis is shown on Figure 2-1, Vicinity Map.

7.2 Site Activities

Field activities to be conducted as part of this RFI (e.g., soil borings, well installations, and well development) are described in the E/A&H Comprehensive Sampling and Analysis Plan (CSAP). Specific health and safety procedures associated with specific activities, hazards, and/or sites are addressed in the appropriate SSHSP.

The Site Supervisor will manage the day-to-day field operations which includes assigning field staff to specific work tasks and coordinating any required logistical support. The Site Supervisor has the authority to suspend or postpone specific field operations if he or she believes that worker health and safety concerns have not been adequately addressed.

Certain activities present a level of hazard that must be dealt with on a case by case basis. These activities are neither covered by this CHASP nor by a SSHSP. Examples of such activities are: confined space entry; moving or sampling of unknown drums or containers; and entering excavations, trenches, or test pits that are more than three feet deep. Should the Project Manager or Site Supervisor deem it necessary to perform an activity such as those listed above, it is that person's responsibility to contact the Project Health and Safety Officer and request an addendum to the SSHSP specifying the health and safety procedures, training, and conditions necessary for undertaking that task. These activities are prohibited until the SSHSP addendum is reviewed, accepted, and implemented.

7.3 Chemical Hazards

Information about specific site chemical hazards will be provided in each SSHSP. Such information will include National Fire Protection Association (NFPA) ratings, symptoms of acute and chronic exposure, carcinogenicity, and OSHA permissible exposure limits (PELs). A table of exposure guidelines for expected site chemicals will be provided. Information in this table will include odor thresholds, OSHA PELs, American Conference of Governmental Industrial Hygienists threshold limit values (ACGIH TLVs), National Institute for Occupational Safety and

Health recommended exposure limits (NIOSH RELs), auto-ignition temperatures, and flammability ranges. Material Safety Data Sheets for these materials will be included in Attachment A of each SIP.

7.4 Operations and Physical Hazards

Field personnel should be aware of and act in a manner to minimize the dangers associated with physical hazards typically encountered during environmental investigations. These hazards include heat-related illnesses, uneven terrain, slippery surfaces, lifting, and use of heavy equipment. Electrical lines may be present either above or below ground, and underground gas lines may be present. Prior to the initiation of drilling activities, drilling locations must be cleared by the Naval Public Works Center (PWC).

Heavy equipment and drill rig operations will be conducted in accordance with the procedures outlined in Attachment A — *Drilling Safety Guide*, provided in this plan. Personnel conducting drill rig operations shall keep clear of all moving parts. To prevent entanglement with the drill rig, loose clothing shall not be worn. The Site Supervisor and Site Health and Safety Officer shall be aware of the potential for heat stress and other weather-related illnesses, and shall implement appropriate work regimens to minimize the likelihood of field personnel becoming ill. When conducting operations or survey work on foot, personnel will walk at all times. Running greatly increases the probability of slipping, tripping, and falling. When working in areas that support habitat for poisonous snakes, personnel shall wear protective chaps made of a heavy material designed to prevent snake bites to the legs.

7.5 Employee protection

Employee protection for this project includes standard safe work practices, NAS Memphis rules of conduct, PPE, personal decontamination procedures, equipment for extreme weather conditions, work limitations, and exposure evaluation.

7.5.1 Standard Safe Work Practices:

- Eating, drinking, chewing gum or tobacco, smoking, or any activity that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated, unless authorized by the Site Health and Safety Officer.
- Hands and face must be thoroughly washed upon leaving the work area.
- No contact lenses will be worn in work areas while invasive actions are conducted.
- Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.
- Contact with contaminated or suspected contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, leachate, or discolored surfaces, or lean, sit, or place equipment on drums, containers, or on soil suspected of being contaminated.
- Medicine and alcohol can exacerbate the effects from exposure to toxic chemicals. Prescribed drugs should not be taken by personnel on cleanup or response operations where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Consumption of alcoholic beverages is prohibited.
- Due to the possible presence of overhead power lines, adequate side and overhead clearance should be maintained to ensure that the drill rig boom does not touch or pass close to any overhead lines.

- Due to the possible presence of underground utilities (including electric, natural gas, water, sewer, telephone, etc.), the activity and local utility representatives should be contacted and requested to identify all lines at the ground surface using characteristic spray paint or labeled stakes. A 3-yard buffer zone should be maintained during all subsurface investigations.
- Due to the flammable properties of some of the potential chemical hazards, all spark or ignition sources should be bonded and/or grounded or mitigated before soil boring advancement or other site activities begin.

7.5.2 NAS Memphis General Rules of Conduct:

- Liquor, firearms, narcotics, tape recorders, and other contraband are not permitted on the premises.
- Any violation of local, state, or federal laws, or conduct which is outside the generally accepted moral standards of the community is prohibited.
- Violation of the Espionage Act, willfully hindering or limiting production, or sabotage is not permitted.
- Willfully damaging or destroying property or removing government records is forbidden.
- Misappropriation or unauthorized altering of any government records is forbidden.
- Securing government tools in a personal or contractor's tool box is forbidden.
- Gambling in any form, selling tickets or articles, taking orders, soliciting subscriptions, taking up collections, etc., is forbidden.

- Doing personal work in government shop or office, using government property or material for unauthorized purposes, or using government telephones for unnecessary or unauthorized local or long distance telephone calls is forbidden.
- Compliance with posted signs and notices is required.
- Boisterousness and noisy or offensive work habits, abusive language, or any verbal, written, symbolic, or other communicative expression which tends to disrupt the work or morale of others is forbidden.
- Fighting or threatening bodily harm to another is forbidden.
- Defacing any government property is forbidden.
- Wearing shorts of any type and/or offensive logos, pictures, or phrases on clothing is forbidden. Shirts, shoes, and pants or slacks or coverall-type garments will be worn at all times on government property.
- All persons operating motor vehicles will obey all NAS Memphis traffic regulations.

7.5.3 Selection of Personal Protective Equipment

It is important that PPE be appropriate to protect against the potential or known hazards at each cleanup or investigation site. Protective equipment will be selected based on the types, concentrations, and routes of personal exposure that may be encountered. In situations where the types of materials and possibilities of contact are unknown or the hazards are not clearly identifiable, a more subjective determination must be made of the PPE required, based on past experiences and sound safety practices.

Table 7-1 Level of Protection and Criteria		
Level of Protection	Criteria for Use	Equipment
Level A	<ul style="list-style-type: none"> When atmospheres are "immediately dangerous to life and health" (IDLH in the NIOSH/OSHA Pocket Guide to Chemical Hazards or other guides.) When known atmospheres or potential situations exist that would affect the skin or eyes or be absorbed into the body through these surfaces. Consult standard references to obtain concentrations hazardous to skin, eyes, or mucous membranes. Potential situations include those where immersion may occur, vapors may be generated, or splashing may occur through site activities. Where atmospheres are oxygen deficient. When the type(s) and or potential concentration of toxic substances are not known. 	<ul style="list-style-type: none"> Positive-pressure full facepiece self-contained breathing apparatus (SCBA) or positive-pressure supplied air respirator with escape SCBA. Fully-encapsulating chemical protective suit. Chemical-resistant inner and outer gloves. Steel toe and shank chemical resistant boots. Hard hat under suit. Two-way radios worn inside suit. Optional: coveralls, long cotton underwear, disposable protective suit, gloves and boots, over fully encapsulating suit.
Level B	<ul style="list-style-type: none"> When respiratory protection is warranted and cartridge respirators are not appropriate. Examples of these conditions are: When work areas contain less than 19.5 percent oxygen, When expected contaminants do not have appropriate warning properties e.g. vinyl chloride, or When cartridges are not available to protect against all contaminants of concern. 	<ul style="list-style-type: none"> Chemical resistant clothes, long sleeves, hooded, one or two pieces. Positive-pressure full facepiece supplied air breathing apparatus or airline system with a 30-minute escape bottle. Hard hat. Inner gloves and chemical resistant gloves. Steel toe and shank boots. Optional: coveralls and disposable outer boots.
Level C	<ul style="list-style-type: none"> When respiratory protection is warranted and cartridge respirators are appropriate. When work areas contain at least 19.5 percent oxygen. 	<ul style="list-style-type: none"> Chemical resistant clothes, long sleeves, hood optional, one or two pieces. Full-facepiece, air purifying respirator equipped with cartridges suitable for the hazard. Hard hat. Inner gloves and chemical resistant gloves. Steel toe and shank boots. Coveralls and disposable outer boots.

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Table 7-1 Level of Protection and Criteria		
Level of Protection	Criteria for Use	Equipment
Level D	<ul style="list-style-type: none"> When level B or C is not indicated. When airborne particulates do not warrant respiratory protection. When work areas contain at least 19.5 percent oxygen. 	<ul style="list-style-type: none"> Inner gloves and chemical-resistant gloves needed to handle soil or water samples. Steel toe and shank boots. Hard hat (ANSI Z891-1969 standard). Eye protection (ANSI Z87.1-1968) standard. Optional: coveralls and disposable outer boots.

Notes:

Level A protection will be selected when the highest available level of respiratory, skin, and eye protection is needed.

Contraindications for use of Level A:

- Environmental measures contiguous to the site indicate that air contaminants do not represent a serious dermal hazard.
- Reliable, accurate historical data do not indicate the presence of severe dermal hazards.
- Open, unconfined areas.
- Minimal probability of vapors or liquids (splash hazards) present which could affect or be absorbed through the skin.
- Total vapor readings indicate 500 ppm to 1,000 ppm.

Level B protection will be selected when the highest level of respiratory protection is needed, but cutaneous exposure to the small unprotected areas of the body, (neck and back of head) is unlikely, or where concentrations are not known to be within acceptable standards. Additionally, the permissible limit for exposure to mixtures of all site gases will be checked using the requirements of 1910.1000(d)(2)(ii) to ensure that PEL is not exceeded. If the value calculated using this method exceeds 1.0, Level B PPE is required.

Level C protection will be selected when the types and concentrations of inseparable material are known, or reasonably assumed to be no greater than the protection factors associated with air-purifying respirators, and exposure to the unprotected areas of the body is unlikely to cause harm.

Dust concentrations require Level C PPE, where the respirable fractions exceed the PEL of 5 mg/m³ or the total concentrations exceed the PEL of 15 mg/m³.

Level D protection will be chosen when measurements of atmospheric concentrations are less than 2 ppm above background levels and work functions preclude splashes, immersion, or the potential for unexpected inhalation or contact with hazardous levels of any chemicals.

The Project Health and Safety Officer will determine the appropriate level of PPE prior to the initial entry based on the best available information. PPE requirements are subject to change as site information is updated or changes. **The decision to upgrade or downgrade levels of PPE shall be made by the Project Health and Safety Officer.**

Field activities which disturb soils will be initiated in Modified Level D protection except when stated otherwise in the SSHSP or site conditions (e.g., sampling results from previous studies) indicate that modified Level D is inappropriate. Modified Level D protection consists of a hard hat, appropriate chemical-resistant gloves (vinyl or nitrile), eye protection, and chemical-resistant, steel-toed and shank boots. Work coveralls (full length sleeves and pants) will be worn if free product or contaminants identified as skin irritants are encountered. This level of protection was selected because the levels of contamination detected in previous studies were low and free product was not detected.

PPE upgrades to Level C will be initiated if airborne concentrations exceeds 2 ppm above the background concentration in the breathing zone or if concentrations of any contaminant exceeds 50 percent of the OSHA PEL. See Table 7-1 for the specific criteria for use and the equipment required for each level of protection.

7.5.4 Air Monitoring

Previous site work indicates that workers may potentially be exposed to low concentrations of numerous chemicals including volatile organic compounds (VOCs), halogenated compounds, and combustible gases/vapors. Based on site history and existing sampling data, "worst case" contaminated areas will be identified prior to initiation of field activities.

Air monitoring using a photoionization detector (PID) and/or other appropriate sampling equipment will be conducted prior to beginning field activities at a new EZ and during ground disturbing activities. The PID will be field calibrated to measure VOCs relative to a 100 ppm

isobutylene standard. If VOCs are detected downhole, colorimetric detector tubes and/or other sampling media may be used to determine the identification and approximate concentration of these compounds.

A combustible gas indicator (CGI) will be used during all soil borings and well installations. The CGI will be field calibrated to measure flammable gases relative to a 23 percent lower explosive limit (LEL) methane standard. Downhole CGI readings will be collected continuously during all soil disturbing operations. Field activities will immediately cease if downhole readings exceed 10 percent LEL. If CGI readings do not subside, a careful investigation and mapping of the area will be made. Operations may not proceed until readings are below 10 percent LEL. The area will be immediately evacuated and the situation re-evaluated to determine how to proceed.

If breathing zone levels exceed 2 ppm or site conditions indicate that additional health and safety precautions are needed, field activities in the area shall stop. Field staff shall notify the Site Supervisor of the situation and he/she shall contact both the Project Manager and the Project Health and Safety Officer. The Project Health and Safety Officer will be responsible for reassessing the hazards and prescribing revised health and safety requirements as necessary, including upgraded PPE requirements, revised work schedules, and revised decontamination procedures. (Typically, PPE will be upgraded to Level C assuming that cartridge respirators are appropriate, otherwise Level B.) See Table 7-1 for specific criteria for each protection level. Work shall not proceed until breathing zone levels return to background levels, and it is reasonably anticipated that breathing zone samples will stay approximately at background levels; or the chemical constituent(s) are identified and appropriate PPE is donned.

Field monitoring values will be recorded in a field logbook and copies must be posted for field personnel review.

On a daily basis, PIDs, CGIs, and other monitoring equipment shall be calibrated or their proper function verified before being used. Throughout the day this equipment shall be periodically checked to ensure that it is working properly. A final calibration shall be conducted at the end of the work day at which time each instrument will be checked to ensure that it is free from surface contamination. Field staff shall record in their field notebooks the fact that they conducted these calibrations and checks and note whether the equipment was or was not functioning properly. When equipment is not functioning properly, it should be brought to the attention of the Site Supervisor or Site Health and Safety Officer who will arrange for repairs and/or replacement of that equipment as needed.

7.5.5 Procedures and Equipment for Extreme Weather Conditions

The seasonal climate in Memphis can be expected to be hot with high relative humidity in the summer months and moderately cold to extremely cold in the winter months. Therefore, heat-and-cold stress will be of concern for all personnel. Adverse weather conditions are important considerations in planning and conducting site operations. Extremes in hot and cold weather can cause physical discomfort, loss of efficiency, and personal injury.

7.5.5.1 Exposure to Hot Weather

Heat stress can result when the protective clothing decreases natural body ventilation even when temperatures are moderate. Various levels of personal protection may require wearing low permeability disposable suits, gloves, and boots which will prevent most natural body ventilation. Discomfort due to increased sweating and body temperature (heat stress) will be expected at the work site.

Heat stress is the metabolic and environmental heat to which an individual is exposed. The manifestations of heat strain are the adjustments made by an individual in response to the stress. The three most important categories of heat-induced illness are: heat exhaustion, heat cramps, and heat stroke. These disorders can occur when the normal responses to increased sweat

production are not adequate to meet the needs for body heat loss or when the temperature regulating mechanisms fail to function properly.

Heat exhaustion is a state of collapse brought about by an insufficient blood supply to the cerebral cortex portion of the brain. The crucial event is low blood pressure caused by inadequate heart output and widespread dilation of blood vessels.

Heat Exhaustion Factors — Factors which can lead to heat exhaustion are as follows:

- Increased dilation of blood vessels causing a decreased capacity of circulation to meet the demands for heat loss to the environment from exercise and from digestive activities.
- Decreased blood volume due to dehydration.
- Reduced blood volume due to lack of physical training, infection, intoxication (from industrial contaminants as well as from drinking alcohol), or heart failure.

Heat Exhaustion Symptoms — The symptoms include extreme weakness or fatigue, dizziness, nausea, or headache. More severe cases may also involve vomiting and possible unconsciousness. The skin becomes clammy and moist, the complexion pale, and the oral temperature stays normal or low, yet the rectal temperature is usually elevated (99.5°F - 101.3°F). Workers who are unacclimated run the highest risk.

Heat Exhaustion Treatment — In most cases, treatment of heat exhaustion is fairly simple. The victim will be moved to a cool place. If the victim is unconscious, medical assistance must be sought. Mild cases may experience immediate recovery; however, more severe cases may require several days care. No permanent effects have ever been reported.

Heat cramps result when the working muscles go into painful spasms. This may occur in people who perspire profusely in heat and who drink large quantities of water, but who fail to replace their bodies' salt. It is the low salt content in the blood that causes the cramping. The abdominal muscles as well as the muscles in the arms and legs may be affected. The cramps may appear during or even after work hours. Persons on a low sodium diet should not be given salt. A physician must be consulted for care of people with this condition.

Heat stroke is the most serious of the health problems that can arise while working in hot environments. It is caused by the breakdown of the thermo-regulatory system under conditions of stress. When this happens, perspiration stops, and the body can no longer regulate its own temperature.

Heat Stroke Symptoms — A heat stroke victim may be identified by hot, dry, and unusually red or spotted skin. The body core temperature can exceed 105°F. Mental confusion, irritability, and chills are common. These are all early warning signs of heat stroke; if the sufferer is not removed from the hot environment at once, more severe symptoms can follow, including unconsciousness, delirium, and convulsions, possibly ending in death.

Heat Stroke Treatment — Heat stroke must be treated as a major medical emergency; medical assistance must be summoned immediately.

Additional treatment:

- First aid must be administered.
- Individual must be moved to a cool location.
- Individual must be cooled through wetting, fanning, or immersion.

Care should be taken to avoid over-cooling and to begin treatment for shock by raising the legs. Early recognition and treatment of heat stroke are the only means of preventing permanent brain damage or death.

To reduce the potential for heat strokes:

- Drink plenty of fluids (to replace loss through sweating).
- Wear cotton undergarments to act as a wick to absorb moisture.
- Make adequate shelter available for taking rest breaks to cool off.

Additional Measures for Extremely Warm Weather:

- Wear cooling devices to aid in ventilation. (NOTE: the additional weight may affect efficiency.)
- Install portable showers or hose down facilities to cool clothing and body.
- Shift working hours to early morning and early evening. Avoid the hottest time of the day.
- Frequently rotate crews wearing protective clothing (if required).

7.5.5.2 Exposure to Cold Weather

Persons working outdoors in temperatures at or below freezing may experience frostbite or hypothermia. Extreme cold for a short time may cause severe injury to the surface of the body. Areas of the body that have a high surface-area-to volume ratio, such as fingers, toes, and ears, are the most susceptible.

Two factors influence the development of cold injury: ambient temperature and wind velocity. As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air, thus, on a cold day the body can cool quickly when PPE is removed and if a person has wet clothing underneath.

Frostbite is a condition in which the cold temperature forms ice crystals in the cells and tissues, dehydrating protoplasm and killing tissues. At the same time, circulation of the blood is blocked. Frostbite could lead to gangrene and amputation.

Frostbite damage occurs in several degrees:

- Frost nip, or incipient frostbite is characterized by sudden whitening of the skin.
- When superficial frostbite occurs, the skin has a waxy or whitish look and is firm to the touch; however, the tissue underneath has retained its resiliency.
- In deep frostbite, the tissues are cold, pale, and solid. The injury is severe. In addition to frostbite, other physiological reactions to cold may be experienced as well. Trench foot, for example, may result from prolonged exposure to low temperatures near, though possibly above, freezing. Walking on the foot is very painful. In very severe cases, the flesh dies and the foot may have to be amputated. Immersion foot is very similar although it is less severe. Although amputation is unusual, some mobility of the limb is lost. Blisters may occur around the lips, nostrils, and eyelids.

Chilblain (pernio), which is an inflammation of the hands and feet caused by exposure to cold and moisture, is characterized by a recurrent localized itching, swelling, and painful inflammation on the fingers, toes, or ears, produced by mild frostbite. Such a sequence produces severe spasms and is accompanied by pain.

Hypothermia occurs when the body loses heat faster than it can produce it. The initial reaction involves the constriction of blood vessels in the hands and feet in an attempt to conserve the heat. After the initial reaction, involuntary shivering begins in an attempt to produce more heat.

Temperature is only a relative factor in cases of hyperthermia. Cases of exposure have occurred in temperatures well above freezing. Humidity is another important factor. Moisture on the skin and clothing will allow body heat to escape many times faster than when the skin and clothing are dry.

Hypothermia occurs when the body's core temperature drops below 96°F. When this happens, the affected person becomes exhausted. He may begin to behave irrationally, move more slowly, stumble, and fall. The speech becomes weak and slurred. If these preliminary symptoms are allowed to pass untreated, stupor, collapse, and unconsciousness occur, possibly ending in death.

To reduce effects of cold exposure:

- **Stay dry.** When the temperature drops below 40°F, change perspiration soaked clothes frequently. When clothes get wet, they lose about 90 percent of their insulating value.
- **Beware of the wind.** A slight breeze carries heat away from bare skin much faster than still air. Wind drives cold air under and through clothing. Wind refrigerates wet clothes. Wind multiplies the problems of staying dry.
- **Understand cold.** Most hypothermia cases develop in temperatures between 30°F and 50°F. Cold water running down the neck and legs or cold water held against the body by wet clothes causes hypothermia.
- **Have shelter available.** Make adequate dry, warm shelter available.
- **Provide warm drinks.**

- **Never ignore shivering.** Persistent shivering is a clear warning that a person is on the verge of hypothermia. Allow for the fact that exposure greatly reduces normal endurance. Warmth generated by physical activity may be the only factor preventing hypothermia.

7.5.6 Personal Decontamination

A CRZ will be established immediate to each sampling/boring site and will include a station for decontaminating equipment and personnel. The CRZ will be covered with sheets of 6-mil polyethylene (typically an area 20-feet by 20-feet is sufficient) with specific stations that will accommodate the removal and disposal of the protective clothing, boot covers, gloves, and respiratory protection if required.

As a general rule, equipment will be decontaminated using a soap and clean water wash solution. Equipment decontamination will be completed by personnel in Level D PPE. In the event of inclement weather (e.g., lightning) or an emergency requiring immediate evacuation, all contaminated equipment will be wrapped and taped in 6-mil polyethylene sheeting and tagged as "contaminated" for later decontamination.

Personnel working in the CRZ will be in one Level of PPE lower than personnel in the EZ. For example, if personnel in the EZ are in Level B, decon workers will be in Level C.

7.5.6.1 Personal Decontamination Procedures

The decontamination procedures, based on Level D protection, will consist of the following:

- Brushing heavily soiled boots and rinsing outer gloves and boots with soap and water.
- Removing outer gloves and depositing them in a plastic-lined container.
- Removing outer chemical protective clothing.

- Washing and rinsing inner gloves.
- Hard hats and eye protection should be washed thoroughly at the end of each work day with a soap and water solution.
- Disposable gloves and any disposable clothing will be disposed of in sealable bags and placed in a clearly labeled 55-gallon drum for disposal by the Navy.
- All field personnel are to be instructed to shower as soon as possible after leaving the site.

Decontamination procedures will be conducted at the lunch break and at the end of each work day. If higher levels of PPE are needed, adjustments will be made to these procedures and an amendment will be made to this CHASP.

All wastes (soil and water) generated during personal decontamination will be collected in clearly labelled 55-gallon drums. The drums will be labeled and characterized by E/A&H or USGS personnel for final disposal by the Navy.

7.5.6.2 Closure of the Personal Decontamination Station

All disposable clothing and plastic sheeting used during site activities will be double-bagged and disposed of in a refuse container. Decontamination and rinse solutions will be placed in a clearly labeled 55-gallon drum for later analysis and disposal. All washtubs, pails, buckets, etc., will be washed, rinsed, and dried at the end of each workday.

7.5.7 Work Limitations

All site activities will be conducted during daylight hours only. All personnel scheduled for these activities will have completed initial health and safety training and actual field training as

specified in 29 CFR 1910.120(e). All supervisors must complete an additional 8 hours of training in site management. All personnel must complete an 8-hour refresher training course on an annual basis in order to continue working at the site.

7.5.8 Exposure Evaluation

All personnel scheduled for site activities will have had a baseline physical examination which includes a stressing exam of the neurologic, cardiopulmonary, musculoskeletal and dermatological systems, pulmonary function testing, multi-chemistry panel and urinalysis, and will have been declared fit for duty. An exposure history form will be completed for each worker participating in site activities. An examination and updated occupational history will be repeated on an annual basis and upon termination of employment, as required by 29 CFR 1910.120(f). The content of the annual or termination examination will be the same as the baseline physical. A qualified physician will review the results of the annual examination and exposure data and request further tests or issue medical clearances as appropriate.

After any job-related injury or illness, there will be a medical examination to determine fitness for duty or any job restrictions. The Site Health and Safety Manager will review the results with the examining physician before releasing the employee for work. A similar examination will be performed if an employee has missed at least three days of work due to a non-job related injury or illness requiring medical attention. Medical records shall be maintained by the employer or the physician for at least 30 years following the termination of employment.

7.6 Medical Monitoring Program

All E/A&H or USGS personnel who enter hazardous-waste/spill sites or have the potential for exposure to hazardous materials from these sites must participate in the E/A&H Medical Monitoring Program or an equivalent program. The program is conducted by E/A&H's company doctor with the company Health and Safety Officer. The purpose of the program is to identify any pre-existing illnesses or problems that would put an employee at unusual risk

from certain exposures or respirators, and to monitor and evaluate exposure-related events where workers are involved in handling hazardous materials. Project managers should consult with the Health and Safety Officer and/or the company doctor concerning the scope of work and known or anticipated chemical hazards associated with each project.

E/A&H maintains the right to exclude certain individuals from particular jobs based on reports from the company doctor. The program will be reviewed on an annual basis to determine its effectiveness. The company doctor has been employed as an independent contractor to provide medical monitoring for E/A&H.

The doctor is responsible for the following aspects of the Medical Monitoring Program:

- Selection and quality assurance of medical and laboratory services involved in carrying out the monitoring program.
- Development of a uniform medical record.
- Record retention.
- Employee notification of examination results.
- Determination of content of the medical and biological monitoring programs.
- Record review and correlation between potential exposure and effect.
- Monitoring job-related illness and injury for each employee.

7.6.1 Preplacement Examinations

Each E/A&H employee will be given a preplacement examination: to identify any preexisting illness or problem that would put the employee at an unusual risk from certain exposures; to assure that each employee can safely use negative-pressure respirators; and to develop a database to assess any exposure-related events detected during periodic medical monitoring. Data accumulation will include variables such as age, sex, race, smoking history, prior employment history, and other conditions that might bear upon the occurrence of subsequent events once employment begins.

The preplacement examination includes:

- Occupational history including previous chemical and carcinogenic exposures.
- Medical history including demographic data, family history, personal habits, past medical history, and a review of current systems.
- Fertility history.
- Physical examination stressing the neurologic, cardiopulmonary, musculoskeletal, and dermatological systems.
- Physiological parameters including blood pressure and visual acuity testing.
- Pulmonary function testing including FVC, FEV1, and FEV 25-75.
- Electrocardiogram.
- PA and lateral chest X-ray.

- A multi-chemistry panel including tests of kidney and liver function.
- Red blood cell cholinesterase.
- Audiogram.

The history, physiological parameters, X-ray, screening tests, and laboratory studies will be conducted before the physical examination. After the physical examination, the medical examiner will review the results of the examination and special studies with each employee and facilitate referral for further evaluation of abnormalities detected during this examination. The Site Health and Safety Officer will provide each employee with a written summary and detailed results of the examination along with identification of any job restrictions. Additional medical testing procedures (e.g., ophthalmology/otometric assessment, specialized audiometric testing, etc.) may be required at the discretion of the employee's attending physician.

7.6.2 Periodic and Exit Examinations

An examination and updated occupational history will be repeated annually and include:

- Updated occupational and medical history.
- Physical examination stressing the neurological, cardiopulmonary, musculoskeletal, and dermatological systems.
- Pulmonary function testing including FVC, FEV₁, and FEV₂₅₋₇₅.
- Multi-chemistry panel including tests of kidney and liver function.
- Urinalysis.

The company doctor will review the results of annual examination and exposure data and request further tests or issue medical clearances as appropriate. An examination will also be administered when an employee leaves the company. The company doctor will be consulted for the contents of the exam except when the employee has had an exam within 6 months, or when there has been no site work since the last examination.

7.6.3 Return-to-Work Examinations

After any job-related injury or illness, a medical examination is required to determine fitness for duty or to identify any job restrictions. The medical examiner will review the results of this back-to-work examination with the company doctor before releasing the employee for work. A similar examination will be performed if an employee has missed at least three days of work due to a non-job-related injury requiring medical attention.

7.6.4 Confidentiality

Medical records will be maintained in a confidential manner so that only authorized persons will have access to the records. The authorized personnel will include medical staff of the joint venture or contract medical personnel, the individual, the individual's personal physician, or the individual's designated representative. Upon written request, the individual may obtain a copy of the medical file which will be provided within 15 days of the receipt of the written request. Information used for research, testing, statistical, or epidemiologic purposes will have all identifying data removed including the identity of the individual. Any medical information or findings obtained which do not affect the individual's job performance will not be made available to E/A&H in order to maintain the patient-physician confidentiality. Upon death, retirement, resignation, or other termination of services, the records will be retained by E/A&H or contracting physician.

7.7 Authorized Personnel

Personnel anticipated to be onsite at various times during site activities include:

- Principal-In-Charge — Dr. James Speakman (E/A&H)
- Task Order Manager — Mr. Lawson Anderson (E/A&H)
- Project Manager — Ms. Ginny Gray (E/A&H)
- Project Health & Safety Officer — Mr. Doug Petty (E/A&H)
- Field Environmental Scientist — Mr. Robert Smith (E/A&H)
- Field Geologist — Mr. Ben Brantley (E/A&H)
- Site Supervisor — To Be Determined
- Site Health & Safety Officer — To Be Determined
- Engineer-in-Charge — Mr. Mark Taylor (SOUTHDIV)
- Naval Air Station Memphis, Tennessee Site Contact — Ms. Tonya Barker

7.7.1 Responsibilities of Site Supervisor

The Site Supervisor will direct the site operations and, relative to health and safety, is responsible for assuring that:

- Field staff follow the CHASP, SSHSP, and other safety and health standard operating procedures (SOPs). Personnel that do not comply are retrained and/or instructed to leave the site and not allowed to return.
- Field staff have current HAZWOPER training.
- Field staff know who the Site Health and Safety Officer is.
- Field staff know the site-specific safety and health concerns.
- There is an adequate onsite supply of health and safety equipment.

- Field staff participate in the E/A&H Medical surveillance program (or in the case of subcontractors, an equivalent program).
- Field staff attend safety and health "kick-off" orientation and other site safety briefings.

The Site Supervisor is also responsible for assuring that field staff who may be exposed to unique or special hazards have the training or experience necessary to safely conduct their work.

7.7.2 Responsibilities of Site Health and Safety Officer

The responsibilities of the Site Health and Safety Officer include:

- Providing the Site Supervisor with technical input on site health and safety issues.
- Observing field personnel and reporting to the Site Supervisor on the effectiveness of the CHASP and SSHSP, and observing whether field staff are utilizing proper work practices and decontamination procedures.
- Reporting significant safety violations to the Project Manager and/or Project Health and Safety Officer.
- Conducting safety briefings during field activities.
- Assuring that a copy of the Health and Safety Plan is maintained onsite during all field activities.
- Maintaining a file of HAZWOPER training certificates and appropriate refresher training certificates for onsite personnel.

The Site Health and Safety Officer will have the following qualifications: (1) 40 hours OSHA training or equivalent experience, (2) 24 hours of supervisory training or equivalent experience, (3) knowledge of the health and safety concerns for the specific work tasks being conducted, and (4) shall be trained to use the air monitoring equipment; be able to interpret the data collected with the instruments; be familiar with symptoms of chemical exposure, heat stress, and cold exposure; and know the location and proper use of onsite safety equipment. He will also be familiar with this CHASP.

The position of Site Health and Safety Officer may rotate. Often, particularly on small projects, this function is not a full time responsibility. Rather, a member of the field team is selected to serve as the Site Health and Safety Officer during a particular task. When that task is completed and/or field staff change, the Site Health and Safety Officer may change as well.

The following criteria outline when the Site Health and Safety Officer will be replaced: (1) termination of employment, (2) end of work task, (3) end of shift, (4) sickness, (5) injury, or (6) death. The SAP calls for one work shift per day. If circumstances arise that require multiple work shifts, an alternate Site Health and Safety Officer will be designated.

7.7.3 Responsibilities of Onsite Field Staff

The health and safety responsibilities of field staff include:

- Being familiar with and complying with the CHASP and SSHSP.
- Attending site health and safety briefings and being aware of anticipated chemical, physical, and biological hazards and knowing what to do when these hazards are encountered.
- Being properly trained on PPE use, safe work practices, decontamination procedures to be followed, and emergency procedures and communications.

- Properly utilizing required PPE, including respiratory protective equipment.
- Having up to date HAZWOPER training and then providing the Site Supervisor with documentation that their training is current.
- Being an up to date participant in an acceptable medical surveillance program.
- Using the buddy system when wearing respiratory protective equipment. When working in Level C or higher, a third person shall be at the work area. This person shall be suitably equipped to provide logistical and safety support to the entry team.
- Being fit-tested and physically capable of using a respirator. Should the use of respiratory protection be required, then field workers shall not have facial hair which interferes with achieving a proper fit.

In addition, field staff should always be alert and use their senses (sight, smell, etc.) to identify and react to potentially dangerous situations. When working in the EZ, visual contact should be maintained between personnel and field personnel should be close enough to assist each other during an emergency. Procedures for leaving a contaminated area must be planned and implemented before going onsite in accordance with the SSHSP.

The number of personnel and equipment in the contaminated area should be kept to a minimum in order to achieve effective site operations. All visitors to the job site must comply with the SSHSP procedures. PPE may be modified for visitors depending on the situation. Modifications must be approved by the Project Health and Safety Officer.

7.8 Emergency Information

All hazardous-waste site activities present a potential risk to onsite personnel. During routine operations risk is minimized by establishing good work practices, staying alert, and by using proper PPE. Unpredictable events such as physical injury, chemical exposure, or fire may occur and must be anticipated.

If any situation or unplanned occurrence requires outside or support service, Ms. Tonya Barker, NAS Memphis Site Contact, will be informed and the appropriate contact from the following list will be made:

Contact	Agency or Organization	Telephone
Tonya Barker	Naval Air Station, Memphis	(901) 873-5461/5462
Mark Taylor	SOUTHDIV Engineer-in-Charge	(803) 743-0573
Law Enforcement	NAS Memphis Base Security	9-911
Fire Department	NAS Memphis	9-911
Ambulance Service	Naval Hospital, Millington Navy Road	(901) 873-5801/5802 or 9-911
Hospital	Methodist North Hospital 3960 Covington Pike	(901) 372-5211 or 9-911
Southern Poison Control Center	—	(901) 528-6048
Lawson Anderson	EnSafe/Allen & Hoshall Memphis, Tennessee	(901) 372-7962
Doug Petty	EnSafe/Allen & Hoshall	(901) 372-7962

Note: These are outdated. See Table 2 in the Site-Specific HASP.

Mark Taylor, SOUTHDIV Engineer-in-Charge will be contacted after appropriate emergency measures have been initiated onsite.

7.8.1 Site Resources

Cellular telephones will be used for emergency use and communication/coordination with NAS Memphis. First aid and eye wash equipment will be available at the work area.

7.8.2 Emergency Procedures

Conditions which may constitute an emergency include any member of the field crew being involved in an accident or experiencing any adverse effects or symptoms of exposure while onsite, or if a condition is discovered that suggests the existence of a situation more hazardous than anticipated.

The following emergency procedures should be followed:

- Site work area entrance and exit routes will be planned and emergency escape routes delineated by the Site Health and Safety Officer.
- If any member of the field team experiences any effects or symptoms of exposure while on the scene, the entire field crew will immediately halt work and act according to the instructions provided by the Site Health and Safety Officer.
- For applicable site activities, wind indicators visible to all onsite personnel will be provided by the Site Health and Safety Officer that indicate possible routes for upwind escape.

- The discovery of any conditions that would suggest the existence of a situation more hazardous than anticipated will result in the suspension of work until the Site Health and Safety Officer has evaluated the situation and provided the appropriate instructions to the field team.
- If an accident occurs, the Project Manager is to complete an Accident Report Form (See Attachment C) for submittal to the managing principal-in-charge of the project.
- If a member of the field crew suffers a personal injury, the Site Health and Safety Officer will call (901) 372-5211 or 9-911 (serious injury) to alert appropriate emergency response agencies, or administer onsite first aid (minor injury) as the situation dictates. An Accident Report Form will be completed for any such incident.
- If a member of the field crew suffers chemical exposure, the affected body areas should be flushed immediately with copious amounts of clean water, and if the situation dictates, the Site Health and Safety Officer should alert appropriate emergency response agencies or personally ensure that the exposed individual is transported to the nearest medical treatment facility for prompt treatment. (See Attachment B for directions to the emergency medical facility.) An Accident Report Form will be completed for any such incident.

Additional information on appropriate chemical exposure treatment methods will be provided through MSDS in Attachment A of each SIP. Directions to the nearest emergency medical facility capable of providing general emergency medical assistance and treating chemical burns

are provided in Attachment B of this CHASP. Directions from individual sites to the NAS Memphis South Gate will be provided as Attachment B of each SIP.

7.9 Forms

The following forms will be used in implementing this CHASP:

Plan Acceptance Form
Plan Feedback Form
Exposure History Form
Accident Report Form

A SSHSP Plan Acceptance Form will be filled out by all employees working on the site before site activities begin. The Plan Feedback Form will be filled out by the Site Health and Safety Officer and any other onsite employee who wishes to fill one out. The Exposure History Form will be completed by both the Project Manager and the individual(s) for whom the form is intended. Examples of each form are provided in Attachment C of this plan.

All completed forms must be returned to the Task Order Manager at EnSafe/Allen & Hoshall, Memphis, Tennessee.

ATTACHMENT A
ENSAFE CORPORATE *HEALTH AND SAFETY* MANUAL
DRILLING SAFETY GUIDE

Appendix B

Drilling Safety Guide

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Drilling Safety Guide

EnSafe is concerned about employee safety while working on or around drill rigs as well as when traveling to and from a drilling site, moving the drill rig and tools from location to location on a site, and during maintenance of the drill rig. Every drill crew will have a designated safety supervisor. The safety supervisor will have the responsibility for ensuring that all drilling operations are conducted in a safe manner. All personnel working on, with, or around a drill rig will be under the jurisdiction of the rig safety supervisor.

Drill Rig Safety Supervisor

The safety supervisor for the drill crew will be the drill rig operator. However, the EnSafe safety officer still maintains the overall safety responsibility for the site. The drill crew safety supervisor is a direct representative of the site health and safety supervisor and will report any safety problems directly to the site health and safety officer. The drill rig safety supervisor will:

- Be the leader in using proper personal protective equipment. He/she will set an example for other personnel to follow.
- Enforce the requirements of the health and safety plan and take appropriate actions when other personnel are not following the requirements of the health and safety plan.
- Ensure that all drill rig and associated drill rig equipment is properly maintained.
- Ensure that all drill rig operating personnel are thoroughly familiar with the drill operations.
- Inspect the drill rig and associated drill rig equipment for damage before starting drilling operations. Check for structural damage, loose bolts or nuts, correct tension in chains and cables, loose or missing guards or protective covers, fluid leaks, damaged hoses and/or damaged pressure gauges and pressure relief valves.
- Test all emergency and warning devices such as emergency shut-down switches at least daily (prior to starting drilling operations). Drilling will not be permitted until all emergency and warning devices are functioning.
- Conduct a safety briefing daily before starting drilling operations. Any new employee will receive a copy of the drilling operations safety manual, and the drill rig manufacturer's operating and maintenance manual.
- Ensure that each employee reads and understands the drill rig manufacturer's operating and maintenance manual.
- Observe the mental, emotional, and physical capabilities of each worker.
- Ensure that each drill rig has a first aid kit and fire extinguisher.
- Maintain a list of emergency contact telephone numbers. This list will be posted in a prominent location and each drill rig employee will be informed of the list's location.

Drill Rig Personnel Protective Equipment

For most geotechnical, mineral, and/or groundwater drilling, drill rig personal protective equipment will include the following:

- Hard hat
- Safety shoes with steel toe and steel shank (or equivalent)
- Gloves
- Safety glasses with side shields
- Close-fitting but comfortable clothes
- Hearing protection

It is important that clothing does not have loose ends, straps, drawstrings or belts, or other unfastened parts that might become caught in or on a rotating or translating part of the drill rig.

Rings, necklaces, or other jewelry will not be worn during drilling operations.

Additional protective equipment may be required by the Site-Specific Health and Safety Plan.

Drill Rig Housekeeping

The following housekeeping measures must be taken for all drilling operations.

- Suitable storage locations will be provided for all tools, materials, and supplies. The storage should be conveniently located and will provide for safe handling of all supplies.
- Drill tools, supplies, and materials will not be transported on the drill rig unless the drill rig is designed and equipped to carry drill tools, supplies, and materials.
- Pipe, drill rods, casing, augers, and similar drilling tools when stored will be stacked in a manner that will prevent spreading, rolling, or sliding.
- Penetration or other driving hammers will be secured to prevent movement when not in use.
- Work areas, platforms, walkways, scaffolding, and other access ways will be kept free of materials, debris and obstructions and substances such as ice, grease, or oil that could cause a surface to become slick or otherwise hazardous.
- Never store gasoline in a nonapproved container. Red, nonsparking, vented containers marked with the word gasoline will be used. The fill spout will have a flame arrester.
- Prior to drilling, adequate site clearing and leveling will be performed to accommodate the drill rig and supplies and to provide a safe working area. Drilling will not be started when tree limbs, unstable ground or site obstructions cause unsafe tool handling conditions.

Maintenance Safety

Well maintained drilling equipment makes drilling operations safer. When performing equipment/tool maintenance, the follow safety precautions will be followed:

- Safety glasses will be worn when maintenance is performed on drill rigs or drilling tools.
- Shut down the drill rig engine to make repairs or adjustments to the rig or to lubricate fittings (except to make repairs or adjustments that can only be made while the engine is running).
- Always block the wheels or lower the leveling jacks or both. Set the hand brake before working under a drill rig.
- Release all pressure on hydraulic systems, the drilling fluid system, and the air operating system of the drill rig prior to performing maintenance.
- Use extreme caution when opening drain plugs and radiator caps and other pressurized plugs and caps.
- Allow time for the engine and exhaust to cool before performing maintenance on these systems.
- Never weld or cut on or near the fuel tank.
- Do not use gasoline or other volatile or flammable liquids as a cleaning agent.
- Follow the manufacturer's recommendations for quantity and type of lubricants, hydraulic fluids and coolants.
- Replace all caps, filler plugs, protective guards or panels, and high pressure hose clamps and chains or cables that have been removed during maintenance.
- Perform a safety inspection prior to starting drilling equipment after maintenance is performed.

Safe Use of Hand Tools

There are a large number of hand tools that can be used on or around a drill rig. The most important rule of hand tools is to use a tool for its intended purpose. The following are a few general and specific safety rules to follow when using hand tools.

- When using a hammer, wear safety glasses and require all others around you to wear safety glasses.
- When using a chisel, wear safety glasses and require all others around you to wear safety glasses.
- Keep all tools cleaned and stored in an orderly manner.
- Use wrenches on nuts, not pliers.
- Use screwdrivers with blades that fit the screw slot.
- When using a wrench on a tight nut, use some penetrating oil, use the largest wrench available that fits the nut, when possible pull on the wrench handle rather than pushing, and apply force to the wrench with both hands when possible and with both feet firmly placed. Do not push or pull with one or both feet on the drill rig or the side of a mud pit or some other blocking-

off device. Always assume that you may lose your footing. To avoid serious injury if you fall, remove sharp objects from the area near you.

- Keep all pipe wrenches clean and in good repair. The jaws of pipe wrenches will be wire brushed frequently to prevent accumulation of dirt and grease which cause wrenches to slip.
- Never use pipe wrenches in place of a rod holding device.
- Replace hock and heel jaws when visibly worn.
- When breaking tool joints on the ground or on a drilling platform, position hands so that fingers will not be smashed between the wrench handle and the ground or the platform if the wrench were to slip or the joint suddenly to let go.

Safety During Drilling Operations

- Do not drive a drill rig from hole to hole with the mast (derrick) in the raised position.
- Before raising the mast, look up to check for overhead obstructions.
- Before raising the mast, all drill rig personnel (except the person raising the mast) and visitors will be cleared from the area immediately to the rear and sides of the mast. All drill rig personnel and visitors will be informed that the mast is being raised prior to raising the mast.
- All drill rig personnel and visitors will be instructed to stand clear of the drill rig immediately prior to and during starting of the engine.
- All gear boxes will be in the neutral position, all hoist levers will be disengaged, all hydraulic levers will be in the nonactuating positions, and the cathead rope will not be on the cathead before starting the drill rig engine.
- The drill rig must be leveled and stabilized with leveling jacks and/or solid cribbing before the mast is raised. The drill rig will be leveled if settling occurs after initial setup.
- The mast will be lowered only when the leveling jacks are down. The leveling jacks must be in the down position until the mast is completely lowered.
- Secure and/or lock the mast according to the drill rig manufacturer's recommendations before starting drilling operations.
- The drill rig must only be operated from the control position. If the operator must leave the control position, the rotary drive and the feed control must be placed in the neutral position. The drill engine will be shut down when the operator leaves the vicinity of the drill rig.
- Throwing or dropping of tools is not permitted. All tools will be carefully passed by hand between personnel or a hoist line will be used.
- When drilling within an enclosed area, ensure that fumes are exhausted out of the area. Exhaust fumes can be toxic and may not be detected by smell.
- Clean mud and grease from boots before mounting the drill platform. Use hand holds and railings. Watch for slippery ground when dismounting from the drill platform.
- Do not touch any metal parts of the drill rig with exposed flesh during freezing weather. Freezing of moist skin to metal can occur almost instantaneously.
- All unattended boreholes must be covered or otherwise protected to prevent drill rig personnel, site visitors, or animals from stepping or falling into the hole.

- Do not attempt to use one or both hands to carry tools when climbing ladders.

Working on Derrick Platforms

- When working on a derrick platform, use a safety belt and a lifeline. The safety belt will be at least 4 inches wide and will fit snugly but comfortably. The lifeline, will be less than 6 feet long and attached to the derrick.
- The safety belt and lifeline will be strong enough to withstand the dynamic force of a 250-pound weight falling 6 feet.
- A safety climbing device will be used when climbing to a derrick platform that is higher than 20 feet.
- The lifeline will be fastened to the derrick just above the derrick platform to a structural member that is not attached to the platform or to other lines or cables supporting the platform.
- Tools will be securely attached to the platform with safety lines. Do not attach a tool to a line attached to the wrist or other body part.
- When working on a derrick platform, do not guide drill rods or pipe into racks or other supports by taking hold of a moving hoist line or a traveling block.
- Derrick platforms over 4 feet above the ground will have toe boards and safety railings.

Working on the Ground

- Workers on the ground must avoid going under elevated platforms.
- Terminate drilling operations and, if possible, lower the mast during an electrical storm.
- Overhead and buried utilities must be located and marked on all boring location plans and boring assignment sheets.
- When there are overhead electrical power lines at or near a drilling site or project, consider all wire to be charged and dangerous.
- Watch for sagging power lines before entering a site. Do not lift power lines to gain entry. Call the utility to have them lift the power lines or to deenergize the power.
- Operations adjacent to overhead lines are prohibited unless one of the following conditions is satisfied:

- Power has been shut off and positive means taken to prevent the lines from being energized.
- Equipment, or any part, does not have the capability of coming within the following minimum clearance from energized overhead lines, or the equipment has been positioned and blocked to assure no part, including cables, can come within the minimum clearances listed in the adjacent table.

Power lines nominal system kv	Minimum required clearance
0-50	10 feet
51-100	12 feet
101-200	15 feet
201-300	20 feet
301-500	25 feet
501-750	35 feet
751-1000	45 feet

- While in transit with boom lowered and no load, the equipment clearance will be a minimum of 4 feet for voltages less than 50kv, 10 feet for voltages 51kv to 345kv, and 16 feet for voltages over 345kv.
- Before working near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter will be de-energized. The following precautions will be taken to dissipate induced voltages:
 - The equipment will be provided with an electrical ground to the upper rotating structure supporting the boom.
 - Ground jumper cables will be attached to materials being handled by boom equipment when electrical charge may be induced while working near energized transmitters. Crews will be provided nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load. Insulating gloves will be used.
- Continue to watch overhead power lines. Both hoist lines and overhead power lines can be moved toward each other by the wind.
- If there are any questions concerning drill rig operations on a site in the vicinity of overhead power lines, call the power company. The power company will provide expert advice as a public service.
- Look for warning signs indicating underground utilities. Underground utilities may be located a considerable distance away from the warning sign. Call the utility and jointly determine the precise location of all underground utility lines, mark and flag the locations, and determine the specific precautions to be taken to ensure safe drilling operations.

Wire Rope Safety

- All wire ropes and fittings will be visually inspected at least once a week for abrasion, broken wires, wear, reduction in rope diameter, reduction in wire diameter, fatigue, corrosion, damage from heat, improper reeving, jamming, crushing, bird caging, kinking, core protrusion, and damage to lifting hardware.
- Wire ropes must be replaced when inspection indicates excessive damage. The *Wire Rope User's Manual* may be used as a guide for determining excessive damage.
- Wire ropes that have not been used for a period of a month or more will be thoroughly inspected before being returned to service.
- All manufactured and end fittings and connections must be installed according to the manufacturer's specifications.
- Swivel bearings on ball-bearing type hoisting swivels must be inspected and lubricated daily to ensure that the swivel rotates freely under load.
- Do not drill through or rotate drill through a slipping device, do not hoist more than 10 feet of the drill rod column above the top of the last (mast), do not hoist a rod column with loose tool joints, and do not make up, tighten, or loosen tool hoists while the rod column is being supported by a rod slipping device.

- Do not attempt to brake the fall of a drill rod column with your hands or by increasing tension on the rod slipping device.
- Wire ropes must be properly matched with each sheave. The sheave will pinch wire rope that is too large. Wire rope that is too small will groove the sheave. Once a sheave is grooved, it will severely pinch and damage larger sized wire rope.
- Use tool handling hoists only for vertical lifting of tools. Do not use tool handling hoists to pull on objects away from the drill rig.
- All hoisting hooks will be equipped with safety latches.
- When tools or similar loads cannot be raised with a hoist, disconnect the hoist line and connect the tools directly to the feed mechanism of the drill. Do not use hydraulic leveling jacks for added pull for the hoist line or the feed mechanism of the drill.
- Minimize shock loading of a wire rope; apply loads smoothly and steadily.
- Avoid sudden loading in cold weather.
- Never use frozen ropes.
- Protect wire rope from sharp corners or edges.
- Replace faulty guides and rollers.
- Replace worn sheaves or worn sheave bearings.
- Know the safe working load of the equipment and tackle. Never exceed safe working limits.
- Periodically inspect clutches and brakes of hoists.
- Always wear gloves when handling wire ropes.
- Do not guide wire rope onto hoist drums with your hands.
- After installation of a new wire rope, the first lift must be a light load to allow the wire rope to adjust.
- Never leave a load suspended when the hoist is unattended.
- Never use a hoist line to ride up the mast.

Cathead and Rope Hoist Safety

- Keep the cathead clean and free of rust and oil and/or grease. The cathead must be cleaned with a wire brush when it becomes rusty.
- Check the cathead for rope-wear grooves. If a rope groove forms that is deeper than 1/8-inch, the cathead must be replaced.
- Always start work with a clean, dry, sound rope. A wet or oily rope may grab the cathead and cause drill tools or other items to be rapidly hoisted to the top of the mast. If the rope grabs the cathead or otherwise becomes tangled in the drum, release the rope and sound the alarm for all personnel to clear the area rapidly.
- The rope must not be permitted to contact chemicals.
- Never wrap the rope from a cathead around a hand, wrist, arm, foot, ankle, leg, or any other body part.
- Attach the hammer to the rope using a knot that will not slip, such as a bowline.

- A minimum of 18 inches must be maintained between the operating hand and the cathead drum when driving samplers, casing, or other tools. Be aware that the rope advances toward the cathead with each hammer blow as the sampler or other drilling tool advances into the ground. Loosen grip on the rope as the hammer falls. Maintaining a tight grip on the rope increases the chances of being pulled into the cathead.
- Do not use a rope that is longer than necessary. A rope that is too long can form a ground loop or otherwise become entangled with the operator's legs.
- Do not leave a cathead unattended with the rope wrapped on the drum.
- Position all other hoist lines to prevent contact with the operating cathead rope.
- The cathead operator must be on a level surface with good, firm footing conditions.

Auger Safety

- The drill rig must be level, the clutch or hydraulic rotation control disengaged, the transmission in low gear and the engine running at low RPM when starting an auger boring.
- Seat the auger head below the ground surface with an adequate amount of downward pressure prior to rotation.
- Observe the auger head while slowly engaging the clutch or rotation control and start rotation. Stay clear of the auger.
- Slowly rotate the auger and auger head while continuing to apply downward pressure. Keep one hand on the clutch or the rotation control at all times until the auger has penetrated about one foot or more below the surface.
- Follow manufacturer's recommended methods for securing the auger to the power coupling.
- Never place hands or fingers under the bottom of an auger section when hoisting the auger over the top of the auger section in the ground or other hard surfaces such as the drill rig platform.
- Never place feet under the auger section that is being hoisted.
- Stay clear of rotating augers and other rotating components of the drill rig.
- Never reach behind or around a rotating auger.
- Use a long-handle shovel to move auger cuttings away from the auger.
- Augers will be cleaned only when the drill rig is in neutral and the augers have stopped rotating.

Rotary and Core Drilling Safety

- Water swivels and hoist plugs must be lubricated and checked for frozen bearings before use.
- Drill rod chuck jaws must be checked periodically and replaced as necessary.
- The weight of the drill rod string and other expected hoist loads must not exceed the hoist and sheave capacities.
- Only the operator of the drill rig will brake or set a manual chuck to ensure that rotation of the chuck will not occur prior to removing the wrench from the chuck.

- The drill rod chuck jaws will not be used to brake drill rods during lowering into the hole.
- Drill rods will not be held or lowered into the hole with pipe wrenches.
- Do not attempt to grab falling drill rods with hands or wrenches.
- In the event of a plugged bit or other circulation blockage, the high pressure in the piping and hose between the pump and the obstruction must be relieved or bled down prior to breaking the first tool joint.
- Use a rubber or other suitable rod wiper to clean rods during removal from the hole. Do not use hands to clean drilling fluids from the drill rods.
- Do not lean unsecured drill rods against the mast.

ATTACHMENT B
DIRECTIONS TO EMERGENCY MEDICAL FACILITIES

000107

DIRECTIONS TO THE NEAREST MEDICAL FACILITIES

The nearest hospital and the nearest facility capable of treating chemical burns are the same facility, which is located at Methodist North Hospital. Therefore, there is only one set of directions.

Nearest Hospital

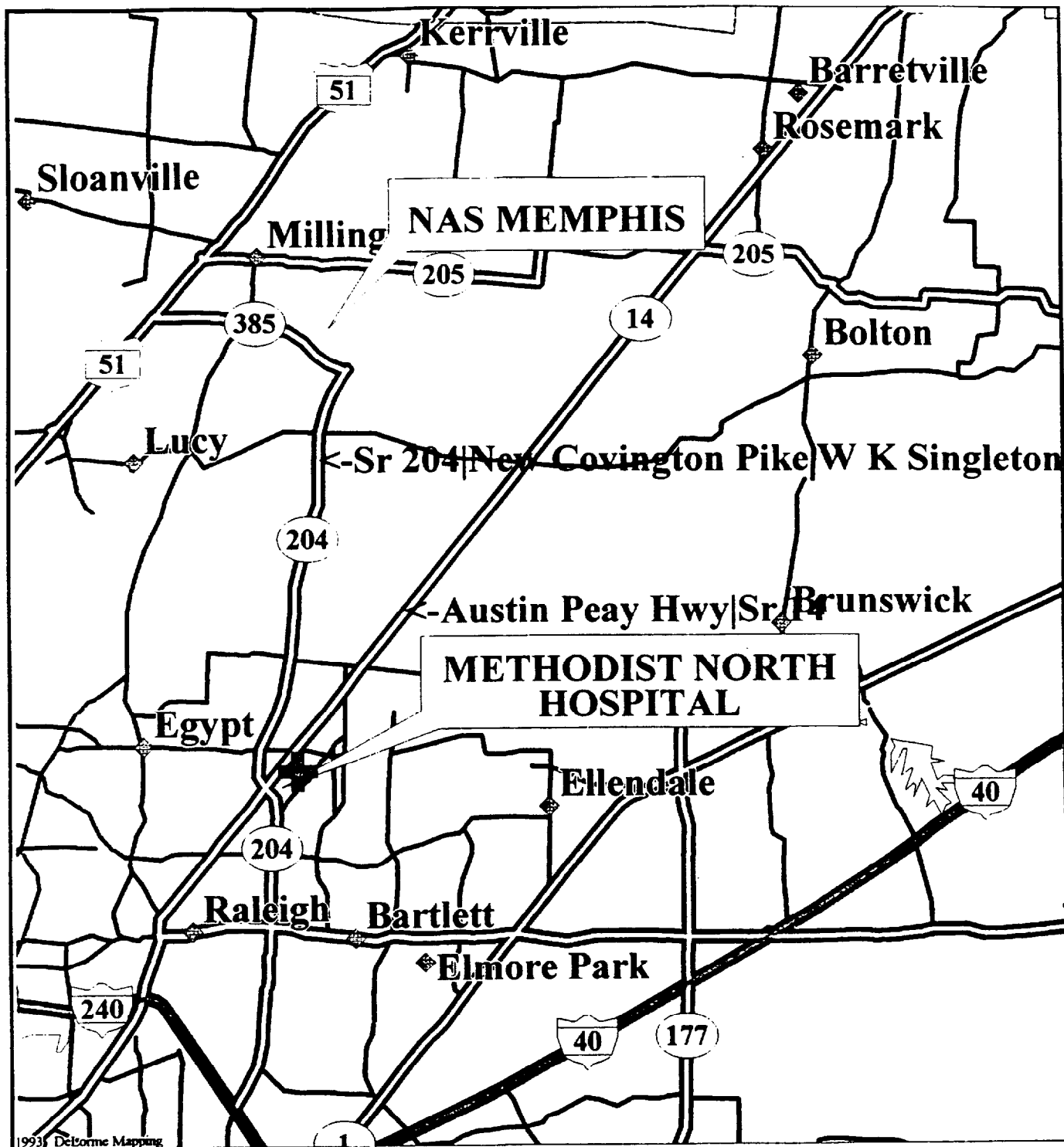
**Methodist North Hospital
3960 Covington Pike
Memphis, Tennessee**

Emergency Room Telephone Number - (901) 372-5211

Directions to Methodist North Hospital from NAS Memphis Main Gate:

1. Exit base through South Gate (Singleton Parkway).
2. Continue on Singleton Parkway through the stop signs.
- 4 Singleton Parkway and Covington Pike will intersect at a red light (about 5 miles).
4. You will see the entrance to the emergency room 700 feet past this light on the left.

Also, refer to the Route to Hospital Map on the following page.



HEALTH & SAFETY PLAN
NAS MEMPHIS
MILLINGTON, TN

DIRECTIONS TO THE HOSPITAL

DWG DATE: 10/04/94 DWG NAME: BOARD

000109

ATTACHMENT C
HEALTH AND SAFETY PLAN FORMS

000110

PLAN ACCEPTANCE FORM

PROJECT HEALTH AND SAFETY PLAN

INSTRUCTIONS: This form is to be completed by each person working on the project work site and returned to EnSafe/Allen & Hoshall, Memphis, Tennessee.

Job No: 2151-016

Contract No: N62467-89-D-0318

Project: Comprehensive Health and Safety Plan

I represent that I have read and understand the contents of the above plan and agree to perform my work in accordance with it.

Signed

Print Name

Company

Date

000111

EMPLOYEE EXPOSURE HISTORY FORM

Employee: _____

Job Name: _____

Date(s) From/To: _____

Hours Onsite: _____

Contaminants (Suspected/Reported):

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on its right side, suggesting it's resting on a surface.

(See Attached Laboratory Analysis)

000112

PLAN FEEDBACK FORM

Problems with plan requirements:

Unexpected situations encountered:

Recommendations for revisions:

ACCIDENT REPORT FORM

SUPERVISOR'S REPORT OF ACCIDENT		DO NOT USE FOR MOTOR VEHICLE OR AIRCRAFT ACCIDENTS	
TO		FROM	
		TELEPHONE (Include area code)	
NAME OF INJURED OR ILL WORKER AND COMPANY			
WORKER'S SOCIAL SECURITY NUMBER			
DATE OF ACCIDENT	TIME OF ACCIDENT	EXACT LOCATION OF ACCIDENT	
NARRATIVE DESCRIPTION OF ACCIDENT			
NATURE OF ILLNESS OR INJURY AND PART OF BODY INVOLVED		LOST TIME YES <input type="checkbox"/> NO <input type="checkbox"/>	
PROBABLE DISABILITY (Check one)			
FATAL <input type="checkbox"/>	LOST WORK DAY WITH ____ DAYS AWAY FROM WORK	LOST WORK DAY WITH ____ DAYS OF RESTRICTED ACTIVITY	NO LOST WORK DAY <input type="checkbox"/> FIRST-AID ONLY <input type="checkbox"/>
CORRECTIVE ACTION RECOMMENDED (By whom and by when)			
NAME OF SUPERVISOR		TITLE	
SIGNATURE		DATE	

000114

Appendix C
Site-Specific Health and Safety Plan

SITE-SPECIFIC HEALTH AND SAFETY PLAN

This site-specific health and safety plan (SSHSP) has been written to complement the comprehensive health and safety plan (CHASP) for NSA Mid-South included in the RFI Work Plan (EnSafe, 1994). Site-specific details presented in this SSHSP include: potential site contaminants, proposed site activities, action levels (ALs), and initial level of personal protective equipment (PPE). Copies of this plan and the CHASP must be onsite during all field operations.

Applicability

The provisions of this plan are mandatory for EnSafe personnel, who shall read the plan and sign the plan acceptance form before starting site activities. In addition, personnel will operate in accordance with the most current requirements of Title 29 Code of Federal Regulations (CFR) 1910.120, Standards for Hazardous Waste Operations and Emergency Response (HAZWOPER). These regulations include the following provisions for employees: training 1910.120(e), medical surveillance 1910.120(f), and PPE 1910.120(g).

All non-EnSafe personnel present at the work areas shall either adopt and abide by this SSHSP and the corresponding CHASP or shall have their own safety plans which, at minimum, meet the requirements of this SSHSP and the CHASP.

This SSHSP applies to standard field procedures and tasks such as collecting soil, water, and confirmatory samples. Non-routine procedures and tasks involving non-routine risks are not covered in this plan. Examples of procedures that are not covered in this plan are:

- Confined space entry
- Locating and/or recovering UXO
- Sampling, handling, or removing unidentified drums

Should it be necessary to conduct these or other "high-risk" tasks, specific health and safety procedures must be developed, approved, and implemented before these tasks may proceed.

Authorized Personnel

- | | |
|--|------------------|
| • TOM/Project Manager | Lawson Anderson |
| • Project Health and Safety Officer (PHSO) | Doug Petty, IHIT |
| • Site Supervisor | Carol Davis |
| • Site Health and Safety Officer (SHSO) | To Be Determined |

Responsibilities of Key Field Staff

It is the overall responsibility of the PHSO to develop and implement the SSHSP. The TOM and PHSO shall approve any changes or modifications to this SSHSP. The SHSO will implement the SSHSP under the PHSO's direction. Health- and safety-related duties may be delegated to qualified individuals by the PHSO or the TOM.

Responsibilities of Site Supervisor

The site supervisor will direct site operations and, relative to health and safety, is responsible for ensuring that:

- Field staff follow the CHASP, SSHSP, and other safety and health standard operating procedures (SOPs). Personnel who repeatedly do not comply shall be retrained and/or instructed to leave the site and not allowed to return.
- Field staff have current HAZWOPER training.
- Field staff know who the PHSO and SHSO are.

- Field staff know the site-specific health and safety concerns.
- The onsite supply of health and safety equipment is adequate.
- Field staff participate in the EnSafe medical surveillance program (or in the case of subcontractors, an equivalent program).
- Field staff attend health and safety "kick-off" orientation and other site safety briefings.

The site supervisor is also responsible for ensuring that field staff who may be exposed to unique or special hazards have the training or experience necessary to safely conduct their work.

Responsibilities of Site Health and Safety Officer

The responsibilities of the SHSO include:

- Providing the site supervisor technical input on site health and safety issues.
- Observing field personnel and reporting to the site supervisor on the effectiveness of the CHASP and SSHSP and whether field staff are using proper work practices and decontamination procedures.
- Reporting significant safety violations to the project manager and/or PHSO.
- Conducting safety briefings as he/she deems appropriate, or when requested by the site supervisor.

- Ensuring that a copy of the appropriate health and safety plans are maintained onsite during field activities.
- Maintaining a file of HAZWOPER training certificates and appropriate refresher training certificates for onsite personnel.

The SHSO will have the following qualifications: (1) 40 hours of Occupational Safety and Health Administration (OSHA) training or equivalent experience, (2) 24 hours of supervisory training or equivalent experience, (3) knowledge of the health and safety concerns for the specific work tasks being conducted, (4) training in the use of the air-monitoring equipment, (5) ability to interpret the data collected with the instruments, (6) familiarity with symptoms of chemical exposure, heat stress, and cold exposure, and (7) knowledge of the location and proper use of onsite safety equipment. He/she will also be familiar with this health and safety plan.

Responsibilities of Onsite Field Staff

The health and safety responsibilities of field staff include:

- Being familiar with and complying with the CHASP and SSHSP.
- Attending site health and safety briefings and being aware of anticipated chemical, physical, and biological hazards and knowing what to do when these hazards are encountered.
- Being trained on PPE use, safe work practices, decontamination procedures to be followed, emergency procedures, and communications.
- Properly using required PPE, including respiratory protective equipment.

- Having up-to-date HAZWOPER training and providing the site supervisor with documentation of that training.
- Being an up-to-date participant in the EnSafe medical monitoring program.
- Using the buddy system when wearing respiratory protective equipment.
- Being fit-tested and physically capable of using a respirator (when one is required). Should respiratory protection be required, field workers shall not have facial hair that interferes with its proper fit.

In addition, field staff should always be alert and use their senses (sight, smell, taste, etc.), to identify and react to potentially dangerous situations. When working in the exclusion zone (EZ), visual contact should be maintained with other personnel in the area; field personnel should be close enough to assist each other in an emergency. Procedures for leaving the EZ must be planned and all necessary equipment present before entering the EZ.

To maintain effective site operations, minimize the number of personnel and equipment in the contaminated area. Site visitors shall comply with the CHASP and this SSHSP, and have the same responsibilities as field staff. PPE requirements may be modified for visitors, depending on the situation. Modifications must be approved by the PHSO.

Work Zones

Section 3.1 of the CHASP describes the function and interrelation of the three work zones at a sampling site or location:

- EZ
- Contaminant Reduction Zone (CRZ)
- Support Zone (SZ)

When determined appropriate by the TOM with input from the RPM, these work zones will be established and used during fieldwork covered under this SSHSP. Each work zone will be clearly marked with cones, barricades, or caution tape, as appropriate, and access to them will be controlled. As a minimum, the area where samples are handled and sampling equipment is decontaminated will be delineated. If needed, a large-equipment decontamination area will be constructed near the EZ.

Authorized personnel will be allowed access to work areas as long as they follow the requirements of this SSHSP and the CHASP, in particular Section 7.1.2 of the CHASP.

Turkey Shoot Area

For several years, the Turkey Shoot Area was used for an annual target shooting event by recreational shooters. Therefore, lead shot has contaminated the area resulting in elevated lead concentrations. Detected soil concentrations range from 155 to 61,700 ppm. EnSafe work at this site includes pre-soil removal sampling to fully delineate extent of contamination, removal oversight, and waste characterization and confirmatory sampling. Additional site-specific information and individual site maps are included in the sampling and analysis section of the removal work plan. The EZ, CRZ, and SZ for the Turkey Shoot Area will be established in the field as determined necessary. The use and locations of these zones depend on the work task, layout of the site, meteorological conditions, and logistical factors.

Site Activities

Field activities include soil sampling using hand augers.. Fieldwork is detailed in Sections 2 and 3 of the removal work plan. The use of heavy, high-powered machinery for site soil removal and intrusive exploration techniques requires careful consideration with respect to safety. Excavating requires that:

- All operations are carefully planned and organized.
- Site control is established.
- Workers are aware of and adequately trained to protect themselves from potential site hazards.
- Personnel trained in hazard recognition and measurement carefully monitor all activities.
- Emergency procedures that provide for rapid hazard identification and abatement are in place.

As discussed in *A Compendium for Superfund Field Operations Methods* (USEPA, 1987), test pits and trenches may be excavated by hand or by power equipment to permit detailed exploration and clear understanding of the nature and condition of in-situ materials.

Chemical Hazards and PPE Requirements

The potential contaminant for the Turkey Shoot Area is lead. In accordance with 29 CFR 1910.1025 Lead Standard, particulate monitoring will be conducted to determine airborne lead levels. Table 1 lists exposure guidelines for these contaminants.

*Site-Specific Health and Safety Plan
Turkey Shoot Area Soil Removal and Sampling Work Plan
Naval Support Activity Mid-South
August 31, 1999*

**Table 1
Exposure Limits for Lead**

Name	Odor ^a Threshold	OSHA PEL ^b	ACGIH TLV ^c	NIOSH REL ^d	Auto- Ignition (°F)	Flammable Range	Instrument
Lead	N.A.	0.05 mg/m ³	0.05 mg/m ³	0.1 mg/m ³	N.A.	N.A.	Personal Pump

Notes:

- ^a = Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
- ^b = Permissible Exposure Limits (PELs) legal standards enforced by OSHA and found in CFR 1910.1000.
- ^c = Threshold Limit Values, and Short-Term Exposure Limits (TLVs and STELs) are recommended guidelines developed by the American Conference for Governmental Industrial Hygienist (ACGIH).
- ^d = Recommended Exposure Limits (RELs) are non-enforceable guidelines developed by the National Institute of Occupational Safety and Health Administration (NIOSH) to support OSHA.
- N.A. = Not Applicable
- ppm = parts per million
- mg/m³ = milligrams per cubic meter

It is important that the PPE specified for the project protect against known and suspected site hazards. Protective equipment is selected based on the types, concentrations, and routes of personal exposure that may be encountered. In situations where the types of materials and possibilities of contact are unknown or the hazards are not clearly identifiable, a more subjective determination must be made of the PPE required, and a greater emphasis is placed on experience and sound safety practices.

PPE:

The initial level of PPE for all field activities performed at this site is Level C. However, based on previous sampling at the Turkey Shoot Area and experience at similar sites, and provided that engineering controls are in place to limit dust, EnSafe is confident that exposure levels will be well below action levels. Level C PPE consists of:

- Full-facepiece, air-purifying, canister-equipped respirator
- Chemical-resistant coveralls
- Chemical-resistant outer gloves; inner gloves or glove liners
- Steel toe and steel shank boots

- Hard hat
- Safety glasses with side shields or safety goggles
- Optional: chemical-resistant outer boots

The AL for this site is 30 micrograms lead dust per cubic meter ($\mu\text{g}/\text{m}^3$) in the breathing zone. If air monitoring shows levels well below this level, Level C may be downgraded to Modified Level D. PPE requirements are subject to change as site information is updated or changes. A decision to deviate from specified levels of PPE as contained in the SSHSP must be made or reviewed by the PHSO.

General Operational and Physical Hazards

Field personnel should be aware of and act in a manner to minimize the dangers associated with physical hazards typically encountered during environmental investigations as discussed in Section 7.4 of the CHASP. At the Turkey Shoot Area, these hazards include heat-related illnesses, snakes, insects, poisonous plants, uneven terrain, slippery surfaces, lifting, and using heavy equipment. Electrical lines may be present either above or below ground, and underground gas, water, and sanitary water drainage lines may be present.

The Site Supervisor shall be aware of the potential for heat stress (discussed in Section 7.5.5.1 of the CHASP). When necessary, work regimens should be implemented to minimize the potential for employee illness.

Employee Protection

Employee protection for this project is addressed in several ways including the use of: work limitations, specified PPE, air monitoring, decontamination procedures, standard safe work practices, general rules of conduct, procedures for extreme weather conditions, and medical surveillance.

Work Limitations

All site activities will be conducted during daylight only. All personnel scheduled for these activities will have completed initial health and safety training and actual field training as specified in 29 CFR 1910.120(e). All supervisors must complete an additional eight hours of HAZWOPER Site Supervisor Training. All personnel must complete an eight-hour refresher training course annually to continue working onsite.

Personnel and Equipment Decontamination

As needed, a CRZ will be established next to the EZs established for invasive activities and will include stations for decontaminating personnel, PPE, and equipment. Decontamination procedures are discussed in Section 7.5.6 of the CHASP.

Standard Safe Work Practices

Standard safe work practices required at the Turkey Shoot Area include:

- Eating, drinking, chewing gum or tobacco, smoking, or any other activity that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated, unless authorized by the SHSO.
- Hands and face must be thoroughly washed when a person leaves the work area.
- Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as practical after leaving the CRZ.
- Contact with contaminated or suspected contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, leachate, or discolored surfaces, or lean, sit, or place equipment on drums, containers, or soil suspected of being contaminated.

- Medicine and alcohol can exacerbate the effects from exposure to toxic chemicals. Prescribed drugs should be not be taken by personnel on cleanup or response operations where the potential for absorption, inhalation, or ingestion of toxic substances exists, unless specifically approved by a qualified physician. Consumption of alcoholic beverages is prohibited.
- Local utility representatives shall be requested to identify all underground utilities. Utility lines should be marked using characteristic spray paint or labeled stakes. A buffer zone, 3 yards to either side of a utility line, should be maintained during all subsurface investigations.

General Rules of Conduct

The following general rules of conduct are required for anyone working on the Turkey Shoot Area Soil Removal and Sampling project:

- Liquor, firearms, narcotics, and other contraband items are not permitted on the premises.
- Any violation of local, state, or federal laws, or conduct which is outside the generally accepted moral standards of the community is prohibited.
- Violation of the Espionage Act, willfully hindering or limiting production, or sabotage is not permitted.
- Willfully damaging or destroying property, or removing government records is forbidden.
- Misappropriation or unauthorized alteration of any government record is forbidden.

- Securing government tools in a personal or contractor's tool box is forbidden.
- Gambling in any form, selling tickets or articles, taking orders, soliciting subscriptions, taking up collections, etc., is forbidden.
- Doing personal work in any government shop or office, using government property or material for unauthorized purposes, or using government telephones for unnecessary or unauthorized local or long-distance telephone calls is forbidden.
- Compliance with posted signs and notices is required.
- Boisterousness and noisy or offensive work habits, abusive language, or any oral, written, symbolic, or other communicative expression that tends to disrupt work or morale of others is forbidden.
- Fighting or threatening bodily harm to another is forbidden.
- Defacing any government property is forbidden.
- Wearing offensive logos, pictures, or phrases on clothing is forbidden. Shirts, shoes, and pants or slacks, or cover-all type garments will be worn at all times on government property.

Medical Monitoring Program

This topic is discussed Section 7.6 of the CHASP.

Emergency Information and Procedures

All hazardous waste site activities present a risk to onsite personnel. During routine operations, risk is minimized by establishing good work practices, staying alert, and using proper PPE. Unpredictable events such as physical injury, chemical exposure, or fire may occur and must be anticipated. Emergency contacts to be used during fieldwork at the Turkey Shoot Area are listed in Table 2.

**Table 2
Emergency Contacts**

Contact	Agency or Organization	Telephone
NSA Mid-South, Env. Div.	Tonya Barker	874-5461
Ambulance		911
Emergency Room	Methodist North Hospital	901/384-5211 911
Southern Poison Control Center		800/942-5969 901/528-6048
Fire Department		911
Police		911
Doug Petty, IHIT	Project Health and Safety Officer	901/372-7962
Lawson Anderson	Task Order Manager	901/372-7962

Site Resources

A cellular telephone will be available in the SZ for routine and emergency communications/coordination with NSA Mid-South personnel. First-aid and eyewash equipment will be available at the work area. All EnSafe field team members have been certified in first-aid and cardiopulmonary resuscitation.

Emergency Procedures

Examples of an emergency include:

- A fire, explosion, or similar event at or near the site whether related to this project or not.
- When a member of the field crew sustains a significant injury, or experiences symptoms of chemical exposure, or other health problem.
- When a condition is discovered which suggests that site conditions are immediately more dangerous or hazardous than anticipated.

In an emergency, the following procedures should be followed:

- If it is necessary to evacuate the area, immediately proceed to a rally point and remain there until instructed otherwise.
- Use planned escape routes. Emergency exit routes and proper use of emergency equipment will be defined for all personnel during an initial safety meeting.
- If a member of the field crew experiences effects or symptoms of exposure while on the scene, the field crew will immediately halt work and act according to the instructions provided by the Site Supervisor or, in his/her absence, the SHSO.
- For applicable site activities, including all Level B activities, use wind indicators to continuously indicate upwind, preferred escape routes, from downwind routes.

- Investigate conditions(s) suggesting that site conditions may be more hazardous than anticipated. Record the condition observed and the decisions made in the safety logbook, or in the field logbook if no safety logbook is being maintained. If there are doubts about how to proceed, suspend work and leave the area until the PHSO has evaluated the situation and provided the appropriate instructions to the field team.
- If an accident occurs, the Site Supervisor is to complete an Accident Report Form for submittal to the TOM and the PHSO.
- If a member of the field crew suffers a personal injury, the SHSO will call the ambulance service for emergency response, if needed. The ambulance service will be used to transport any injured persons. Next alert appropriate response agencies as the situation dictates. Complete an Accident Response Form for any such incident.
- If a member of the field crew suffers a chemical exposure, flush the affected areas immediately with copious amounts of clean water, and if the situation dictates, the SHSO should alert appropriate emergency response agencies, or personally ensure that the exposed individual is transported to the nearest medical treatment facility for prompt treatment. (See Figure 4-1 for directions to the emergency medical facilities.) If a patient is contaminated, the ambulance and/or hospital will be notified prior to receiving the patient. An Accident Report Form will be completed for any such incident. Additional information on appropriate chemical exposure treatment methods will be provided through Material Safety Data Sheets (MSDSs).

Forms

The following forms will be used in implementing this health and safety plan:

- Plan Acceptance Form
- Plan Feedback Form
- Accident Report Form

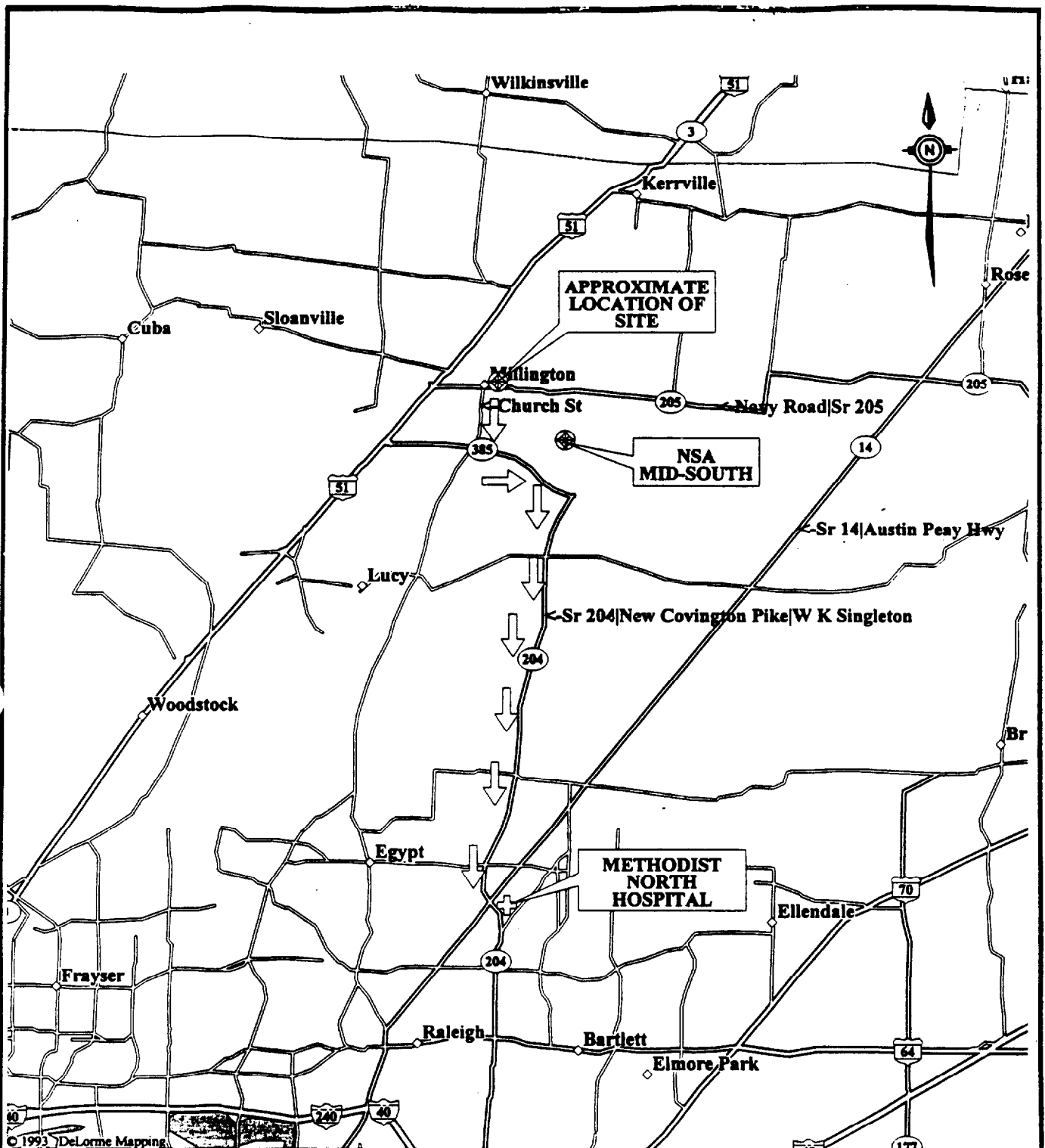
An SSHSP Plan Acceptance Form will be filled out by all employees onsite before activities begin. The Plan Feedback Form will be filled out by the SHSO and any other onsite employee who wishes to do so. Examples of all forms are included in this plan. All completed forms must be returned to the TOM at EnSafe, Memphis, Tennessee.

Directions to the Nearest Medical Facility

The nearest hospital is Methodist North Hospital, 3960 New Covington Pike, Memphis, Tennessee 38128 (see map on following page).

Directions to Methodist North Hospital from NSA Mid-South:

- 1) Navy Road west to Raleigh-Millington Road.
- 2) Left on Raleigh-Millington to Paul Barrett Parkway.
- 3) East on Paul Barrett to Singleton Parkway.
- 4) South on Singleton Parkway through the stop signs.
- 5) Singleton Parkway and Covington Pike will intersect at a red light (about 5 miles).



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ENSAFE

(800) 588-7862
MEMPHIS, TENNESSEE
CHARLESTON, SC CINCINNATI, OH DALLAS, TX JACKSON, TN KNOXVILLE, TN
LANCASTER, PA NASHVILLE, TN NORFOLK, VA PADUCAH, KY PENSACOLA, FL
RALEIGH, NC COLOGNE, GERMANY

DIRECTIONS TO THE HOSPITAL

DWG DATE: 11/09/98 DWG NAME: BORDER

000132

*Site-Specific Health and Safety Plan
Turkey Shoot Area Soil Removal and Sampling Work Plan
Naval Support Activity Mid-South
August 31, 1999*

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**PLAN ACCEPTANCE FORM
PROJECT HEALTH AND SAFETY PLAN**

INSTRUCTIONS: This form is to be completed by each person working on the project site and returned to: EnSafe, Memphis, Tennessee.

Job No: 0094-001-29-000-00

Contract No: N62467-89-0318

Project: Turkey Shoot Area Soil Removal and Sampling Work Plan

I have read and understand the contents of the above plan and agree to perform my work in accordance with it. I certify I am in compliance with the applicable OSHA training requirements pertaining to the following:

Check all that apply

- ☐ 40-hour HAZWOPER training per 29 CFR 1910.120 (required)
- ☐ 8-hour HAZWOPER Refresher per 29 CFR 1910.120 (required; if applicable)
- ☐ 8-hour HAZWOPER Site Supervisor per 29 CFR 1910.120 (required; if applicable)
- ☐ First Aid (if applicable)
- ☐ CPR (if applicable)

Signed

Print Name

Company

Date

*Site-Specific Health and Safety Plan
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Naval Support Activity Mid-South
August 31, 1999*

EMPLOYEE EXPOSURE HISTORY FORM

Employee: _____

Job Name: _____

Date(s) From/To: _____

Hours Onsite: _____

Contaminants (Suspected/Reported):

This image shows a single sheet of white paper with horizontal black ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slightly textured appearance, typical of standard office or school paper. There are no margins, text, or other markings on the page.

(See Attached Laboratory Analysis)

PLAN FEEDBACK FORM

Problems with plan requirements:

Unexpected situations encountered:

Recommendations for revisions:

